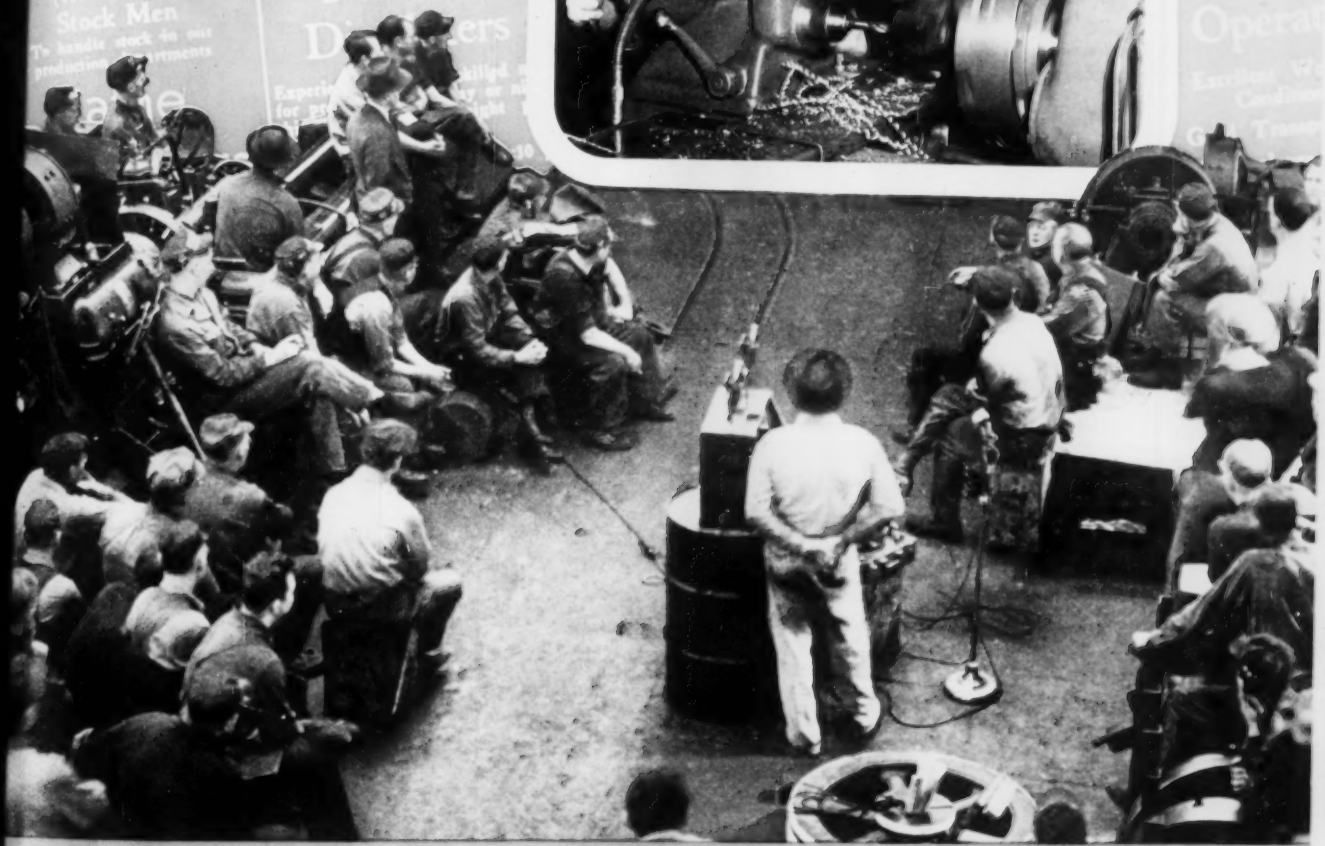
FEBRUARY 19, 1951

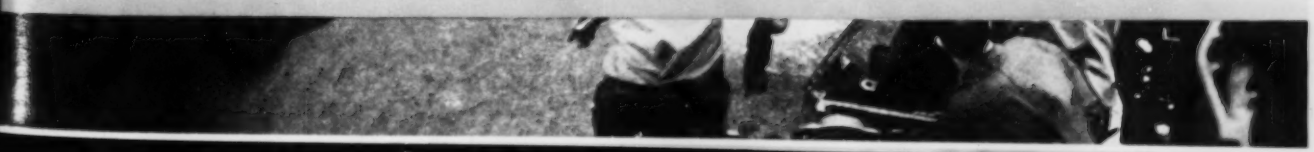
STEEL

The Weekly Magazine of Metalworking

Need Skilled Workers?



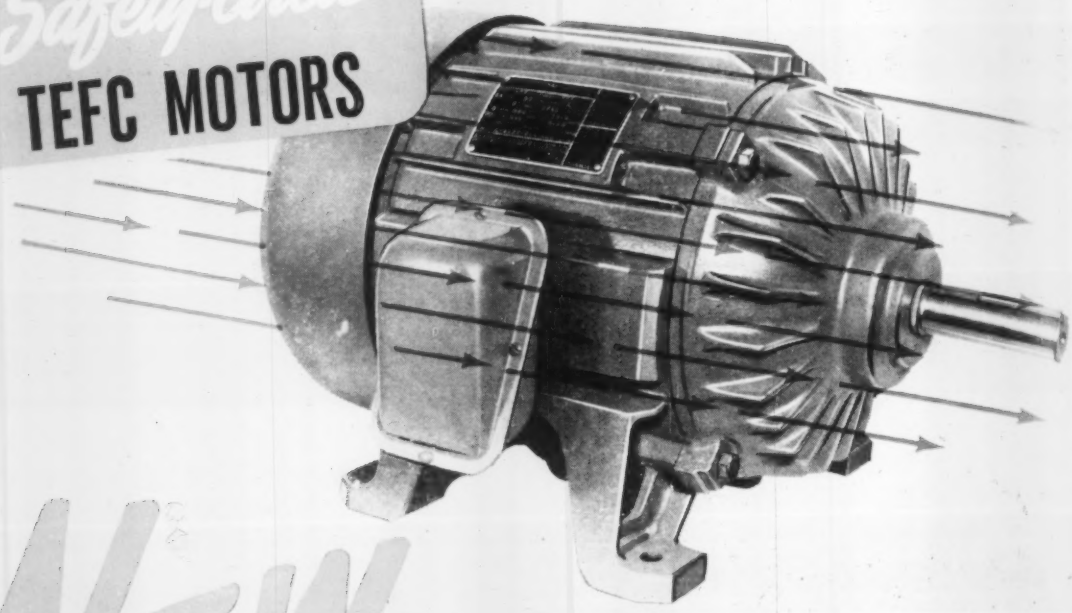
TRAIN . . . RECRUIT . . . UPGRADE —see page 35



ALLIS-CHALMERS

"Safety-Circle"

TEFC MOTORS



NEW

Easy to Clean Protected From Dirt

THIS NEW *Safety Circle* totally-enclosed, fan-cooled motor cannot clog with dirt. The ribbed cooling surfaces are outside the motor. There are no pockets or crevices where dirt can collect. Cooling air is not enclosed at any point except the fan cover.

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Factory Lubricated Bearings

Bearings are lubricated at the factory and operate without attention or cost for years. The frame of this *Safety Circle* TEFC motor is cast iron, inherently corrosion resistant, strong and rigid. The extra rigidity of the cast iron frame holds the bearings in true alignment under severe operating conditions. This gives long bearing life and low operating costs.

Get All The Facts

The new *Safety Circle* totally-enclosed fan-cooled motor is built in all NEMA standard frame sizes from 224 to 505. Your Allis-Chalmers Authorized Dealer or Sales Office has complete information. Call today or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B6144.

A-3235

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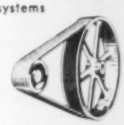
CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.



PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Safety Circle, Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

STEEL
The Weekly Magazine of Metalworking

VOL. 128 NO. 8 FEBRUARY 19, 1951

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Next Week **... Tooling for Defense Production ... Who's Who in Defense Mobilization ... Compression-Sized Tubing May Offer Machining Economies ... Sulphide Precoats Facilitate Metal Forming**

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

NO LIMIT ON ZINC TO REPLACE CADMIUM IN ELECTROPLATING

Zinc-Luster-on ® Treatment Offers Superior Finish — Permitted by NPA Order

Latest NPA Order on Use of Zinc (M-15 as amended Jan. 15, 1951) leaves way open for present cadmium platers to stay in business and at same time offer superior finish on products. Paragraph 28.27 specifically exempts from 80% quota or 3,000 lb. monthly clause use of zinc "in electroplating where it replaces cadmium".

Passivated zinc has long been recognized by eminent authorities to be equal or actually superior to cadmium for most applications except in direct marine atmosphere. This recent NPA order may result in its becoming life-saver to cadmium-starved industries. Within quota restrictions same applies to nickel casualties.

Luster-on is original passivating bright dip introduced in 1944 by Chemical Corporation of Springfield, Mass. In recent months their newest formulations tagged "Luster-on Utility-15" and "Luster-on Utility-25" have amazed finish experts with their brilliance, ease of application and control and low cost. Cost figures under 1/5c per square foot have been verified again and again by large users.

Stromberg-Carlson, Magnavox, Monowatt Div. of G. E., National Lock, American Cabinet Hardware, Simmons Co., Bonney Forge & Tool, Canadian Marconi, Canadian G. E., American Bosch, Westinghouse, Ternstedt Div. of General Motors, Peerless Wire and hundreds of similar national accounts are using Luster-on Utility Dip on their plated zinc.

Shortage of certain raw material ingredients will limit quantity of Luster-on available for 1951. Former users of nickel and cadmium are converting almost daily. Chemical Corporation is, however, still accepting applications of well-rated concerns for '51 allotments. Preference naturally goes to products where demonstrated superiority and economy of zinc-Luster-on finish can bring change in specifications after return of cadmium or nickel.

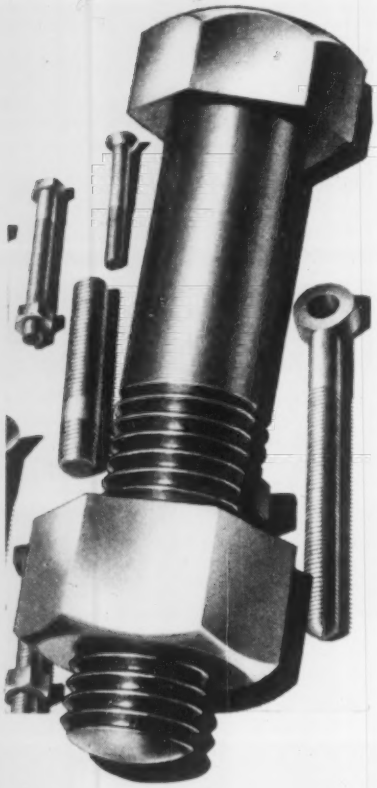
Suggest writing Metal Finishing Department, Chemical Corporation, 56 Waltham Ave., Springfield, Mass. for technical data and to discuss your requirements. Company will process sample parts without charge and furnish engineering service on conversions to Luster-on.

LUSTER-ON ® OLIVE DRAB ANNOUNCED; FOR U. S. ORDERS ONLY

As this column went to press a new Olive Drab color Luster-on Dip for zinc-plated surfaces was announced by Chemical Corporation, 56 Waltham Ave., Springfield, Mass. The new material is shipped in highly concentrated form which makes it the most economical such treatment on the market. At present it is available only for U. S. Government orders. Sample parts will be treated free.

Advertisement

First for
BOLTS
NUTS
STUDS



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Behind the Scenes . .

No Oversight

Eagle-eyed readers of the Feb. 12 issue have written in to point out a slight discrepancy in last week's book. On the cover appeared the line, "55,000 Contract, Supply Opportunities," which referred to a roundup on aircraft procurement on page 43. On that page appeared a facsimile of the cover, with a few lines of type under it explaining how it was designed. Plainly reproduced on the miniature cover were the words: "Aircraft Program Needs Subcontractors."

How come? We brought up the matter with the editors upstairs and discovered we had caught them in no oversight after all. When the copy for the facsimile cut had to go to the engravers, they were burning up the telephone lines to Washington and Wright field in Dayton trying to get an estimate on the specific number of subcontractors and suppliers that would be needed in the aircraft program. The boys got the figure, 55,000, in time to be set in type for the cover but too late to be inserted on the facsimile copy going to the engravers. A dummy head was worked up and instructions sent for a foggy reproduction of the facsimile lines, so that they would be nearly illegible.

That apparently irked the spirit of craftsmanship in our engravers who came up with a reproduction that's as clear as a bell.

Restful

Thumbing through the ambitious procurement programs of the Armed Forces, we came across a projected purchase of 1,643,688 canvas and steel cots for the Army and Air Force, not to mention 200,000 pillow covers and 5,646,805 cotton bed sheets. Sleep, sleep, sleep!

The Weather

General Electric Co. won't enforce any of its patents relating to weather modification by the artificial production of snow and rain.

We're relieved to learn this. We're ardently in favor of free enterprise, but somehow it goes against the grain to have our snow storms controlled by any finite corporation. We think GE saw the large question involved and wisely put its patents in the public domain. GE is well aware of the government and labor complaints against big business and the near-universal griping about the weather. To have had all that grousing on its neck would have been too much.

Paid in Full

A businessman realized he was at death's door and called his partner to his bedside. He then began a tale of confession.

"George," he said, "I've got to tell you this. I've embezzled $7950 from our firm and the invention you were about to patent I sold for $75,000. It was I, too, who sent your wife that photograph that got her the divorce. . . ."

"Oh, forget it, pal," consoled George. "I'm the one who put the arsenic in your dessert."

The Tune Changes

In April, 1924, a lecturer—a prominent and powerful world figure—in a talk at a foreign university paid this compliment to American efficiency: "American efficiency is that indomitable spirit that neither knows nor will be deterred by any obstacle, that plugs away with businesslike perseverance until every impediment has been removed, that simply must go through with a job once it has been tackled. . ."

Who made those remarks? Josef Stalin.

Puzzle Corner

The rail strike fouled up the mails so badly that we have received no answers to the shipping puzzle of Feb. 5. The launch travelled 220 nautical miles.

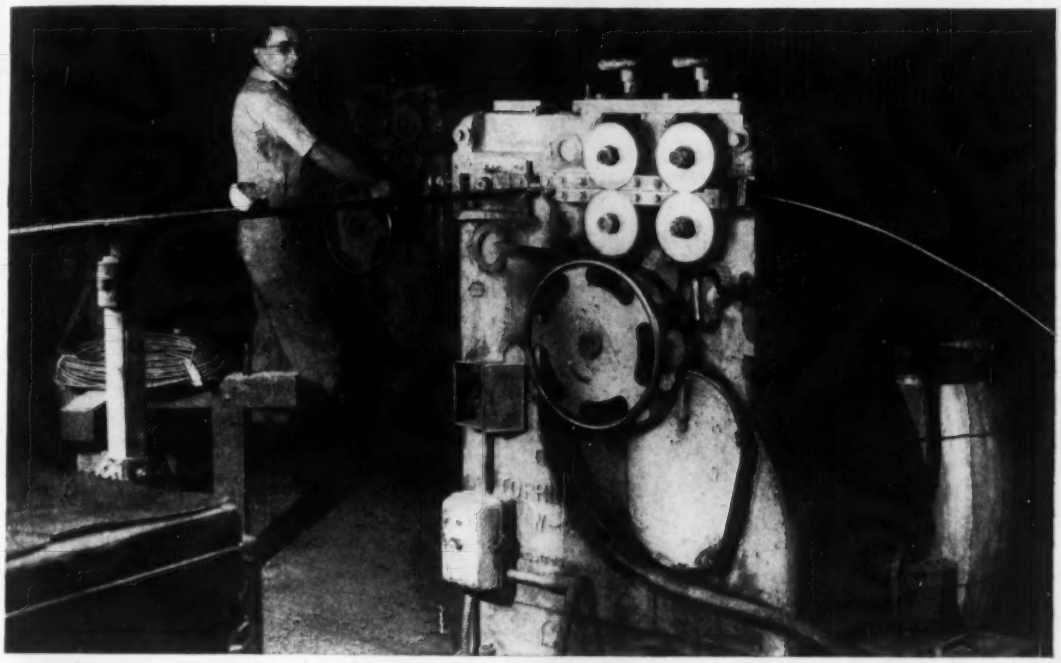
Three pastures are covered with grass of equal density that grows at an even and constant rate. The first pasture has an area of 24 acres, the second an area of 75 acres and the third 180 acres.

If the first pasture can feed 12 cows for 3 weeks and the second can feed 25 cows for 5 weeks, how many weeks can 30 cows feed full fare on the third pasture, provided that every cow eats the same amount each week and the same amount weekly as every other cow?

Shrdlu

(Metalworking Outlook—page 27)

HIGH CARBON WIRE



Manufacturing control casing with Roebling wire.

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WHEREVER a manufactured product calls for high carbon steel wire, Roebling wire will bring you top results . . . and help your production, too! Every inch of these Roebling specialty wires is identical in grain, gauge and finish. Your preparation time is lowered; machine stoppages and rejects cut way down. And there's a Roebling round, flat or shaped wire for almost every application.

Roebling's specialty wire plant is one of the largest in America. Today a large share of its output is required in the rearmament program. We assure you, however, that we will always do our level best to fill your orders as required. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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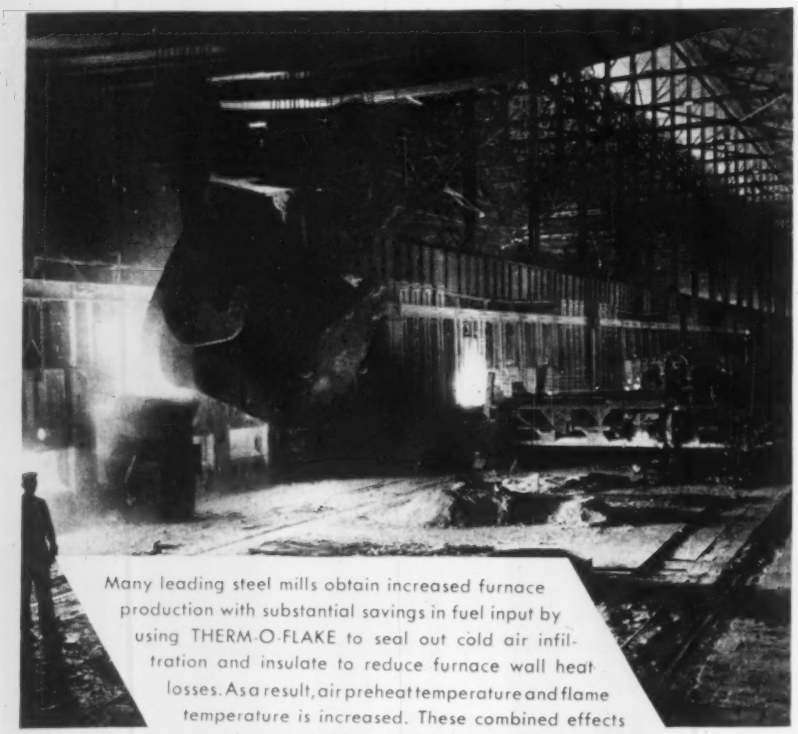
Let easy-to-apply

Therm-O-flake

show you fuel savings up to 15%
with increased furnace production!



Many leading steel mills obtain increased furnace production with substantial savings in fuel input by using THERM-O-FLAKE to seal out cold air infiltration and insulate to reduce furnace wall heat losses. As a result, air preheat temperature and flame temperature is increased. These combined effects produce a sharper, faster working furnace with savings in fuel and operating costs several hundred times the little investment in THERM-O-FLAKE. THERM-O-FLAKE accomplishes fuel savings and increased furnace production because it was designed specifically for this work. It will pay you to have a thermal study made of your furnaces with estimated fuel savings to be enjoyed using THERM-O-FLAKE. Write today for detailed information.

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LETTERS
TO THE EDITORS

Salesmen's Activities

I am sure you realize that much of our thinking today cannot be expressed editorially. However, there is a subject which might be suitable for expression in your very worthy publication and which I personally feel is very timely. This pertains to salesmen's activities.

In times of average industrial activity a salesman on a commission basis will keep himself pretty well occupied to provide food and shelter for himself and family and perhaps put a little money in the bank. We are facing a period when industrial expansion is rampant and a salesman finds considerably increased income per hour invested in selling.

If the pattern follows that which occurred in 1941-43, many heretofore capable salesmen are going to sit on the telephone, make a few calls, call it a day, and go out to the country club for a round of golf. They probably figure that since the factory can't deliver against new orders, there is no sense in calling on customers. Also, since their income has materially increased, the natural tendency is to slack off a little bit.

When you analyze the reason for manufacturers using salesmen in the first place, you can readily see that the man is losing sight of the fundamentals when he follows such a course. It reflects not only to the discredit of the man, but his company as well, and as in the past postwar period of 1946-48, the readjustment back to a normal working day becomes almost an unbearable chore.

For ourselves, we are undertaking a continual educational program with our salesmen to keep them on their toes and on guard against such an attitude. Perhaps the support of people like yourself would aid materially.

W. J. Vossbrinck, Sales Manager
Cleco Division, Reed Roller Bit Co.
Houston, Tex.

Directory Found Valuable

We are glad to see that you have such a valuable directory of government personnel connected with the mobilization program in your annual edition of January 1. A number of departments of the Chamber of Commerce have asked permission to clip this directory. We are hoping that you have had so many requests that you are making reprints.

Beata V. Drake, Librarian
Chamber of Commerce of the United States of America, Washington, D. C.

• *Tearsheets of the directory, which began on page 102, are being sent.*

No Smell, No Germs:

We have noticed an article entitled, "No Smell, No Germs", appearing on page 56 of the Dec. 25, 1950, issue. This article describes a preservative for coolants and cutting oils. We would like to find out who is the manufacturer.

M. R. Wiard, Chief Engineer
Campbell, Wyant & Cannon Foundry Co.
Muskegon, Mich.

• *The coolant and cutting oil preservative is made by West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.*

The Metalworking Outlook

No Controls by 1953

How long will economic controls be necessary? Economic Stabilization Administrator Eric Johnston says that "barring a full-scale attack, I believe two or three years will be as long as we may need them." He refused to elaborate further, but his estimate on the matter is one of the first given by a public official. Significance: The shift in Korean fortunes and the passage of time is at last letting us see the forest, not just the trees.

Tough Question: Tax Effect on Prices

Conflicting ESA testimony at Congressional tax hearings arises because the agency within its own ranks is trying to resolve this knotty dilemma: Will higher taxes' stabilizing benefits on consumer income offset the disadvantages because increased levies—particularly excises—tend to boost prices? Michael DiSalle in his testimony is alarmed at the latter possibilities. His boss, Eric Johnston, soft-pedals that angle and plugs for most of the administration's program. Probable compromise: Higher income taxes but less extreme excises.

Needed: Higher Reserves for Taxes

You can get set for the coming tax hikes by increasing your reserves to handle the higher federal take. Credit men are beginning to check to see that their customers are adequately prepared. A possibility is that an unwary management may be caught by surprise by a sharply increased income rate.

New Pension Campaign in the Works

Expect unions to campaign harder to line up more companies in the noncontributory pension program. One reason: Pension experts estimate that under prospective higher taxes, it would cost employees from four to eight times as much more to finance contributory pensions as it would cost their employers to finance like benefits for them. That's why labor representatives on the Wage Stabilization Board are pushing so hard to get "fringe" benefits exempt from wage controls.

WSB Debates 'Escalator' Issue

The pension deal is a reserve arrow in labor's bow. It will be shot, but with less force if the "escalator" arrow hits the mark. To permit or not to permit escalator pay boosts is still being debated by WSB. The labor and public members say "yes." The industry members are in the minority and say "no." Escalator increases will probably be permitted, but they will be limited to 8 or 10 per cent of some base period, perhaps last May and June.

Shenannigans in Agriculture

Industry men who have gone into the federal defense organization are throwing up their hands at what some of the regular

Production-Engineering News—p. 63 *The Market Outlook—p. 119*

government brass are doing. ESA is trying to encourage moderate consumer buying. What can it do when Agriculture Secretary Brannan turns around and urges farmers to place orders for new farm machinery and parts as fast as possible?

More Industrial Expansion?

Outlook for industrial expansion is even better now that credit restrictions have been placed on commercial building. At the start of the year an estimated $22 billion was predicted for industry's expenditures on new plant and equipment. That may rise as it becomes easier to get labor to build new manufacturing facilities. Thus far, labor has been a tougher problem than materials in expediting construction. NPA has the power to issue authorization for new commercial projects it thinks will aid defense. It began granting approvals last week.

Trucking Bottlenecks Develop

If you freight by truck, get set for bottlenecks and shortages to develop as trucking equipment gets more scarce. The armed forces are likely to need so many trailers that they'll absorb the trailer manufacturing industry's total capacities. Truck manufacturers are plagued by materials shortages that will hamper production soon if they're not solved. The industry has asked NPA to exempt it for the remainder of the first half from limitations on uses of aluminum, copper and other scarce items. NPA is noncommittal about the proposal.

Grist from Washington

NPA is asking plumbing brass goods manufacturers to standardize their products, simplify design and reduce the thickness of plating wherever possible . . . Munitions contracts totaling $44 million will be awarded within 60 days by Birmingham Ordnance District . . . Fairchild Airplane & Engine Corp. will make components and parts for its still-secret jet engine project at Valley Stream, L. I., plant.

What Industry Is Doing

It will be largely up to you to have a recruiting and training program set when the labor pinch begins to hurt (p. 35) . . . The newest set-aside requirements for defense-rated steel orders will affect April rolling schedules (p. 38) . . . New alloy steels, leaner in alloy content than the National Emergency steels of World War II, soon will come into use (p. 38) . . . Several score additional metalworking and related companies have received certificates of necessity for defense expansion (p. 40) . . . Autos and consumers' hard goods will be cut back not over 35 per cent by summer (p. 37). . . . Dealers and rebuilders of used machinery expect a record 1951—if the supply of used equipment holds (p. 46) . . . Detroit is worried about what will happen to the electroplating industry (p. 49).

Incongruous

A frequent complaint in Washington these days is that it is difficult to attract top flight business men to temporary government jobs during the emergency. President Truman has emphasized this point on numerous occasions and he has demonstrated his real concern about it by the staunch manner in which he has stood back of Director of Defense Mobilization Charles E. Wilson.

One reason why capable industrial executives are reluctant to serve in public office in Washington is that they know they will be working in the uncomfortable environment of many firmly entrenched career government employees who distrust business men. They know also that on occasion some of these men with anti-business complexes are in positions to discredit the work of temporary business executives no matter how satisfactory it may be. Industrial experts on loan to the government do not like the idea of working under the constant threat of internal sabotage.

Recently this normal animosity toward business personnel has been heightened by two factors. The Department of Justice has issued several rulings that imply official distrust of anybody who is not a regular government employee. President Truman has been counseling some of his associates to watch representatives of business and industry closely. Possibly this admonition stems from his experience as a senator in World War II when he headed a committee charged with checking skulduggery in government war contracts.

No one should criticize honest attempts to maintain all activities in connection with the emergency on the highest possible plane of integrity. However, it should be possible to do this without adopting the policy that everybody who comes to Washington is to be placed under suspicion automatically.

The President's attitude in regard to suspicion and distrust really is incongruous. He instinctively questions the motives of business men at the same time he closes eyes and ears to evidence that some of his White House cronies and appointees in Reconstruction Finance Corporation are guilty of shady practices.

This atmosphere of condoned "inside" misconduct and unwarranted suspicion of "outsiders" is harming the defense effort. It should be cleared away immediately.

E. L. Shaner

EDITOR-IN-CHIEF

RECRUITING, TRAINING: Most manufacturers who were in the saddle throughout World War II are fully aware of the problem of manpower in time of emergency. They know that the employer has to do the best he can with a large percentage of employees who are not ideally fitted for the work they are expected to do. This fact alone should convince

AS THE EDITOR VIEWS THE NEWS

anybody that there is need for special training under the conditions we are going to meet in the immediate future.

Numerous private organizations are promoting intensive job training in various ways without much help from the government. One wonders why Washington bureaus, which always are on the lookout for new ways to render service, still are asleep on this problem.

Of equal importance to specialized training is resourcefulness in procurement. One company has used the familiar "open house" as a vehicle for encouraging employees' families to recruit new workers for the plant. —pp. 35, 46

POWDER AIDS CUTTING: Shipyard of the Alabama Dry Dock & Shipbuilding Co. at Mobile, Ala., is making good use of an ingenious method of powder cutting on some of its more difficult flame piercing, beveling and cutting jobs. An oxyacetylene blowpipe is employed into which an iron powder is introduced by means of a tube. Ignition of the powder creates sufficient extra heat to enable the flame to cut through stainless steel door casings for ship boilers, to cut and bevel brass bars and bronze plates, to sever cast iron sections and to cut copper pipe into sections with almost the same speed that an orthodox oxyacetylene torch cuts through carbon steel. —p. 72

TIME LAG IMPORTANT: Flow of war orders to automobile companies is increasing steadily. This indicates progress, but before we become too ecstatic about it we should consider the time lag between placing of the order and the beginning of production.

One of the first large war contracts was issued to Cadillac to build tanks in the former Fisher body plant in Cleveland. This contract was let last July. Cadillac lost no time in getting into action. Tanks Nos. 1 and 2—hand built—will be completed in April. No. 3, a production job, will follow soon thereafter. Here, under favorable conditions, is a contract-to-production lag of nine months. On this basis many of the contracts let recently will not be in production until late this year.

Meanwhile, automobile and truck output for the first seven weeks of 1951 is 985,383 units against 947,665 in the same period of last year —an increase of 4 per cent. Motordom can build a goodly number of peacetime cars before production on war orders interferes seriously. —p. 50

WASTING MANPOWER: A sore point with many highly specialized large and small industrial companies is the run-around given them by government agencies on the problem of retaining a few skilled and essential key men whom the military would like to induct into the armed services. The Department of Commerce had a list of essential occupations which seemed to be authoritative, but most Selective Service draft boards give it a brush-off. Apparently no publicized list of essential occupations has any official standing with the military.

The result is that one of your key specialists who is really doing something important for defense may be taken away from you and in the devious and uncertain process of inducting him into the army, navy or marine corps, he may wind up in a job where his chief contribution to winning the war will be sorting doughboys' mail in Pusan, peeling potatoes in Yokosuka or working in a post exchange in Frankfurt or Berlin. —p. 36

FOR BETTER COUPLERS: At a conference on machine design in Cleveland, W. R. Slattery of Ford Motor Co. described with text, slides and moving pictures the system of mechanically loading and unloading work from machines, inspecting it and transferring it from machine to machine. This system has been given the coined name of "automation."

From the interesting evidence displayed by Mr. Slattery it is obvious that to achieve any degree of automation with today's stock machine tools requires much ingenuity and not a little of something that is reminiscent of the Rube Goldberg technique. As automation comes into more widespread use, builders of machine tools, presses, gaging machines and handling equipment doubtless will give more attention to such details as standard heights and locations of the entering and outgoing stations of their equipment. If we are going in for the close linking of machine units on a grand scale, we will need more practical "couplers" than are found in most of the improvisations of today. —p. 67

Films and other visual aids can supplement on-the-job personnel training in the fight to beat the labor scarcity.

Ready for Manpower Shortage?

It will largely be up to you to have a recruiting and training program set when the labor pinch begins to hurt. Washington as yet offers little help

WOMEN CONSTITUTE ONE LABOR RESERVOIR

. . . a slump of only 8 per cent since war peak of 20 million

PREVENTIVE medicine is needed to nip a mild ailment now that could become a chronic malady later. Have you the prescription to ward off a threatening manpower shortage? The U. S. Labor Department hasn't.

The government has appointed several defense manpower experts; they have not yet had time to develop specific programs. The Labor Department says it will "put into motion" a plan for improving the skills of workers. The momentum promised by that program excites no one in industry.

It's Up to You—So, your survival in a defense economy will depend upon your resourcefulness in recruiting labor to fill the holes made by the draft and the needs generated by increased defense production and upon your skill in training the raw recruits once you find them.

What to do? Hire everyone you can lay your hands on even if you don't need them yet? Some companies already in defense production have had to start extensive recruiting programs, but most of metalworking hasn't had to—yet. A few firms are resorting to the costly practice of hoarding labor. You still have time—but not much—to prepare an inexpensive and wise program for when you do have to recruit on a big scale. Here's what you can do:

Slide Into a Plan—Plant the seeds of a personnel training program now, even though you aren't yet increasing your payroll materially. Many personnel experts agree that it's best to start training gradually, with a minimum shock to your present employees. Hire a training director, or if your company is too small to support one, appoint someone in management to take on the job as a part time responsibility. A representative company employing 3000 last year paid its director $5500 and had a training budget of $4000. Scale your budget up or down according to the size of your company, but you can't go much below $4500 to get a good director.

Get a Key Man—A good man to fill the training directorship is hard to find. Few universities offer specific courses for the career. An emergency training program to train training directors may relieve the situation. The Northern Ohio chapter of the American Society for Training Directors has set up a course for Ohio industry. If it works, it will be offered in the other 26 regional districts in which the society functions.

Start with the Top—Begin your program with management, particularly foremen. Develop an organization chart, showing the responsibility and authority of each member of management. Analyze each position in the company carrying supervisory responsibility to determine the functions, responsibilities, authorities, education and work experience required for proper performance. When analysis is completed, precise job descriptions should be developed and salary limits set.

Meet Once a Week—Weekly training meetings should be conducted in which all management members participate. Monthly dinner meetings are advisable, too. Subjects to be covered might include administration of the union contract; labor-management relations; improved techniques in handling problems involving human relations; safety; and others. No actual job training is recommended for supervisors, for if they don't know their job they have no business in management in the first place. The top-level training program serves a triple purpose: It slides into a full scale plan, to cause a minimum of disruption in normal company activities; it serves as a proving ground for the full program; it gives needed training to management.

Makes a Round-up—Data that develops during the course of the man-

agement training program should be gathered in a manual for each member of supervision. The manual should contain an analysis of the union contract, federal and state statutes affecting labor relations and a complete set of company approved policies and procedures.

Broaden the Program About in the middle of the management program, the time comes to expand the plan to all employees. Purpose of the general plan is both to upgrade present employees and to train new ones. Upgrading is important because it's the chief way you'll be able to get more highly skilled workers.

Face Problems Ahead Before you expand your program, consider these questions: Will you pay part or all of the expense of outside schooling for an employee seeking new skills? Training directors agree that the company should pay part of the expense, but you may have to pay all in a tight labor market. Can you enlist the support of a good trade school and public high schools in your area for training machine operators? For a small and medium-sized company, it's best to get outside help both to upgrade old workers and train new ones. Factory training should be co-ordinated with the outside help. Will you pay new workers while they are training? In the present labor market, you will probably have to.

Figure It Out In setting up the program for hourly employees, determine the skill patterns of employment requirements for skilled, semi-skilled and unskilled workers. Analyze and describe all the jobs in your plant. Decide in which jobs and in what number you need skilled workers in an expanded production program. Make a breakdown of jobs as to the length of the training program necessary to fill them. Figure what jobs can be broken down into duties that need lesser skills. Your program requires flexibility so you can speed it up if events dictate the step. Much of your program to break big skills into little skills will be a blueprint for use only when and if needed.

Once you have your training program lined up, you are partly equipped to cope with a manpower shortage, but you still have to set up your labor recruiting methods. The job is tough because in the labor market are only 1.9 million unemployed, of whom 768,000 are women. That figure cannot be materially reduced. Some out of work are complete misfits; others are shifting from one job to another. An estimated 2 million more workers will be needed before the year is out.

Untapped But there are labor reservoirs that you can still use. Women are one source, but since the World War II peak when 19,980,000 women were working, there has been a fall of only 8 per cent in the number of the weaker sex on the job in industry. That's despite the fact that at the war height, 50 per cent of all employees were women. Now about 2 per cent of all employees are women. Older employees who have retired or soon are scheduled to are a good source, too. Handicapped people make good workers, but the problem is to get them accepted by other employees. Clerical, sales and service personnel you already employ may also be shifted to production jobs. Longer hours for present employees can help, but it doesn't pay to go much beyond 48 hours a week.

To get recruits, establish liaison with private and state employment agencies, high schools, trade schools and colleges. Let your employees know when you want workers. Keep a file on the whereabouts of former employees. When you do find a prospect, an intelligence and character test is advisable. You may not find a trained person, but you can at least pick intelligent, reliable employees.

Off on the Right Foot When you hire a new employee, a formal indoctrination procedure is important. A form carrying pay, age, test results and other data should be begun for the new worker, and for the old if a setup has not been started. Personnel records should be reviewed periodically when promotion, transfer or a merit increase is contemplated.

A personnel training program is like castor oil seemingly a bother now but eminently useful later in warding off the effects of a disease that could debilitate you.

NEA

DR. ARTHUR S. FLEMMING
. . . outside the Labor Department

Die Makers Send Manpower SOS

How can we keep our skilled men particularly our apprentices and trainees—in the face of military drafts under the Selective Service System? How can we get the machine tools and other equipment we need to take care of military and other essential requirements?

These were the principal questions asked by trustees of the National Tool & Die Manufacturers Association in conferences with defense agencies in Washington, Feb. 8 and 9. The country's 450 contract tool and die shops, they say, are faced with unprecedented demands; due to the great gain in the amount of instrumentation on modern implements of war, and due to the development of such new weapons as guided missiles and jet aircraft, the tooling job ahead is about $2\frac{1}{2}$ times that of the tooling job at the start of World War II. The industry needs 20 to 25 per cent more skilled workers and a large amount of complex equipment which it cannot obtain due to the favored status of DO-rated consumers.

To both these questions the association trustees obtained limited answers. NPA assurances were obtained that an order now in process would enable the industry to use a DO rating to obtain needed machine tools and other equipment, but how extensively this power could be utilized was not made clear. At the Labor Department they were told that the department's list of critical occupations and essential industries was being revised and enlarged, but there was no assurance as to the extent to which this list would be observed by local draft boards in granting deferments.

Mr. Tobin Gets Outflanked

The appointment of Dr. Arthur S. Flemming, a Republican and president of Ohio Wesleyan University, as top labor adviser to Defense Boss Charles E. Wilson indicates the administration's decision to form a new organization outside the regular Labor Department to wrestle with defense manpower problems.

A Labor Department nominee, George M. Harrison, president of the Brotherhood of Railway & Steamship Clerks, was named special assistant to ESA Chief Eric Johnston, but Mr. Harrison's position is far less important than Dr. Flemming's.

Industry's criticism of the Labor Department's inertia in tackling manpower shortages may be reaching the

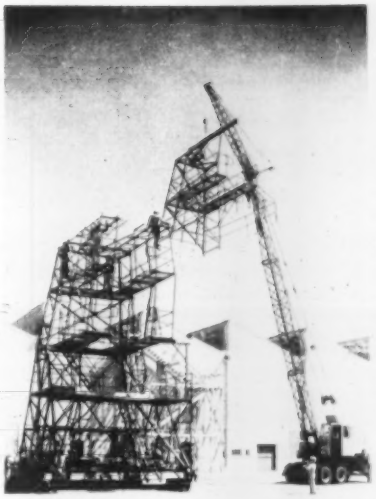
White House. A man in industry with whom STEEL interviewed about what can be done to relieve the labor shortage says, "Whatever can be done, we don't count much on the department for help."

Random Jobs Can Be Gaged

An abbreviated technique for work measurement was announced on Feb. 9 to industrial engineers attending a one-day conference sponsored by the Cleveland Chapter of the American Institute of Industrial Engineers. James H. Duncan, partner in Work-Factor Co., New York, worked out the abbreviated system to fill a need in industry for an accurate means of rating work where small production rates or maintenance jobs make detailed rates uneconomic.

In the new method, established motion times for common groups of motions have been lumped together and re-evaluated so that many tasks in which seven elements were formerly studied and evaluated are resolved into one. Accuracy of the system checks to within 12 per cent of that obtainable from detailed systems. The firm of management consultants claims almost anybody can put it into use within a few hours without prior training or experience with stopwatch or other methods.

The original intensive study of thousands of motion times between 1934 and 1938 established basic work-factors now widely used as the guide to scientific work rating in industries where production rates range from 50,000 to over 1 million units. Using this method eliminates the stopwatch for all but machine times and is said to conserve time, improve output and make for better employee relations.



SKY HIGH: An 80-foot boom on this Lorain Moto-Crane is necessary to erect the steel scaffolding used to service the tail of a B-36 bomber. Here the highest platform is being put in position at the San Diego, Calif., plant of Consolidated Vultee

No Set Rule for Draft Deferment of Vital Worker

MANY employers erroneously believe that local draft boards, in granting deferments, are governed by a list of critical occupations and essential industries. There isn't any such list as far as Selective Service is concerned.

The misunderstanding arises because of lists promulgated by the Commerce and Labor Departments last August and accepted by the Department of Defense for use in determining which men to call into active service—and which not to call—from the armed services' organized reserves and the National Guard.

Free Will—Selective Service did send copies of these lists to local draft boards, but was careful to leave the local boards free as before to reach their own decisions as to which men to defer and which to put in Class 1-A.

The Labor and Commerce Departments are revising their lists of essential industries and critical occupations in the hope that they will have "more authority" with the Selective Service System, and particularly with the local draft boards. Selective Service headquarters spokesmen recall that the lists prepared by the War Manpower Commission during World War II confused the draft boards because occupational deferments essential in some parts of the country were not necessary or desirable elsewhere.

Who Goes?—A question which is asked by many employers every day in letters to the national headquarters of the Selective Service System is: "What are the criteria for occupational deferment?"

The answer: "In Class II-A shall be placed any registrant whose employment in industry, or other occupation or employment, or whose continued service in an office . . . or whose activity in study, research, or medical, scientific or other endeavors is found to be necessary to the maintenance of the national health, safety, or interest."

Deferment "Ifs"—The registrant's employment is necessary to the maintenance of the national health, safety or interest only when all of these three conditions exist: "The registrant is, or but for a seasonal or temporary interruption would be, engaged in such activity; the registrant cannot be replaced because of a shortage of persons with his qualifications or skill in such activity; and the removal of the registrant would cause a material loss of effectiveness in such activity."

Employers who seek deferment of employees on the basis of these criteria and who are able to present acceptable evidence in support of their requests should have no trouble in getting fair treatment from local draft boards—at least during the period ahead when the boards will not be faced with demands requiring them to scrape the bottom of the manpower barrel.

Cutbacks: What To Expect

Autos, consumers durable goods may be pinched back in May or June by 20 to 30 per cent

CUTBACKS will have to be made in the production of automobiles and consumer durable goods generally but the size of the cutbacks and the timing have not yet been determined. That is what a top NPA official told STEEL last week in reply to a request for the best possible forecast of coming production curbs.

Here is the top thinking in NPA on this subject:

Production of automobiles and other consumer durable goods will have to be curtailed, probably around May or June. Maybe no NPA order will be required to bring such cutbacks; possibly the needed decrease in production will ensue from the copper and other use-limitation orders; possibly it will result from voluntary action by automobile and other manufacturers.

How much of a reduction in production will be needed? NPA thinking now is in terms of 20 to 30 per cent; that size cutback would free a lot of steel for defense and defense-support programs and for small business generally.

Is there any basis for reports that the curtailment might be as much as 40 per cent? NPA thinking is that such a curtailment would be too great in the face of the relatively small amount of defense business so far placed with or under negotiation with the manufacturers of automobiles and other consumer durables; the curtailment should not be so great as to cause an undue amount of unemployment at these plants.

Defense Puts Another Bite on Steel

Newest set-aside requirements for defense-rated orders affect April rolling schedules. On some products increases are sharp; on others there are no changes

PINCH on civilian steel supplies grows tighter. National Production Authority again has increased the set-aside requirements for DO-rated orders, which means less steel will be available for civilian production.

On some products increases are sharp, on others they are moderate, and no changes are made on still other items.

Hit April Schedules—Steelmakers were informed of the revised set-asides just before expiration of the 45 days lead time for second quarter, so that changes become effective immediately for April schedules.

Sharpest increase in set-aside is in alloy mechanical tubing, upped 25 points to 60 per cent. Cold-finished bar set-asides are increased 15 points to 40 per cent; semifinished products, 10 points to 45 per cent.

Tightening Up — On the carbon products, semifinished items are increased 5 points to 10 per cent; tube rounds 10 points to 15 per cent; cold-finished bars, 15 points to 25 per cent; hot-rolled sheets 5 points to 17 per cent; cold-rolled sheets, 3 points to 15. Hot and cold-rolled strip are up 2 points to 12 per cent.

No changes were effected in set-asides for tin mill products, holding at 5 per cent, and on stainless products which continue at 25 per cent. Carbon and alloy billets of projectile and shell steel quality are subject to NPA directive, as are alloy plates for rolled armor plate. On hot-rolled carbon and alloy bars, 35 per cent of the set-aside is for projectile and shell steel.

The Pitch on Plates—Starting May 1, the set-asides on carbon and alloy plates will be increased from the present 15 per cent to 20 per cent.

Set-aside tonnages for the various products, compared with the schedule recently in effect, are:

CARBON STEEL

	Old	New
	%	%
Mechanical tubing	10	15
Blooms, slabs and billets	5	10
Tube rounds	5	15
Sheet bars	5	5
Wire rod	10	15
Hot-rolled bars	10	15
Hot-rolled bars, projectile & shell quality	0	In amount equal to 35 per cent of the tonnage represented by the hot-rolled carbon bar set-aside
Reinforcing bars	15	20
Cold-finished bars	15	25
Wire, drawn, low-carbon	5	10
Hot-rolled sheets	12	17
Cold-rolled sheets	12	15
Galvanized sheets	7	10
All other coated sheets	7	10
Hot-rolled strip	10	12
Cold-rolled strip	10	12
Rough forgings	20	30

ALLOY STEEL

Blooms, slabs, billets	35	45
Tube rounds	35	60
Sheet bars	35	5
Hot-rolled bars	35	45
Hot-rolled bars, projectile & shell quality	0	35 per cent of tonnage represented by hot-rolled alloy bars set-aside
Cold-finished bars	25	40
Mechanical tubing	35	60
Rough forgings	20	30

U. S. Orders 25 Cargo Ships

The Maritime Administration has awarded contracts to five shipyards for construction of 25 high-speed cargo ships whose total cost will be about $200 million.

The contracts mark the first large-scale government shipbuilding program since World War II. The yards will each build five ships. They are: Newport News Shipbuilding & Drydock Co., Newport News, Va.; Ingalls Shipbuilding Corp., Pascagoula, Miss.; Bethelehem Steel Co., Sparrows Point-Baltimore, Md. and Quincy, Mass.; and Sun Shipbuilding & Drydock Corp., Chester, Pa.

Leaner Alloys Developed

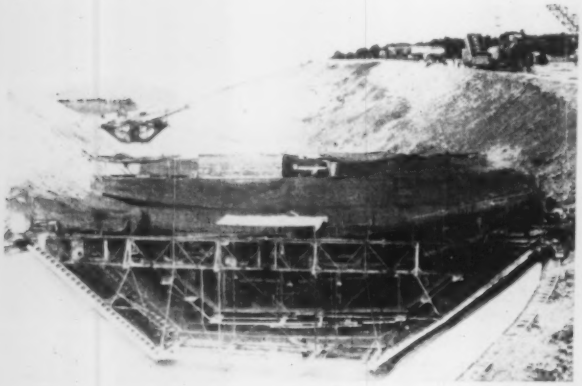
Two new series contain less of critical elements than NE steels of World War II

NEW ALLOY steels, leaner in alloy content than the National Emergency steels of World War II, soon will come into use. The new steels, designed to replace the more heavily alloyed standard steels were developed by the Technical Committee on Alloy Steel through co-operative research of the American Iron & Steel Institute in steel company laboratories.

Work on these steels started several months ago when it became apparent that the standard alloying elements would become critically short in the face of an expanded defense program.

Boron-Treated—The new steels employ very small quantities of the critical alloying elements nickel, chromium and molybdenum and are treated with a non-critical alloy containing the element boron. The use of critical elements is presently restricted by government orders. There are unlimited supplies of boron in the United States. Boron acts to increase the hardenability of the steel, that is, its ability to harden deeply when heat treated by quenching and tempering. That action increases the strength of the steel without reducing its toughness.

Leaner than NE Steels—Two series of steels have been developed for practically all the engineering and constructional purposes for which standard alloy steels are used. The



NEA

MAN-MADE RIVER: Stretching 153 miles through California's San Joaquin Valley is the Friant-Kern Canal that carries water for the Central Valley project. Concrete lining is placed by a rail-mounted "lining jumbo" which can lay 1000 lineal feet per hour. In background is mobile "trimmer" that grades bed and sloping banks of the canal

new steels, which are balanced multiple alloy steels, are designed to make maximum use of the alloys contained in scrap. Both series contain an average of 0.30 per cent nickel and 0.12 per cent molybdenum. One series contains an average of 0.25 per cent chromium, the other 0.43 per cent. The National Emergency steels of World War II contained nearly twice that quantity of critical elements. Such savings will not only assist in building the defense stockpile but will make more alloys available for military uses.

Steel Output Breaks Record

More steel poured from the nation's furnaces in January than in any other month in history. American Iron & Steel Institute reports output for the month totaled 8,830,000 net tons, equivalent to production of nearly 104 million tons on an annual basis. Steelmaking furnaces operated at 99.7 per cent of capacity in the month against 97.9 in December.

The January record topped the previous high mark, set in October 1950, by 90,000 tons and exceeded January, 1950, production by 900,000 tons, or more than 11 per cent. It also was nearly a half million tons above the revised December output which brought total production for all of 1950 to 96,696,769 net tons, an increase of 24 per cent over 1949.

Annual ingot capacity of the industry as of Jan. 1, 1951, stood at 104,229,650 net tons, an increase of 4,837,000 tons over the like date in 1950.

CMP Announcement Coming

Formal announcement of the switch from the present priority system to a controlled materials plan is expected to be made before the end of March, and certainly no later than early April, with July 1 as the effective date.

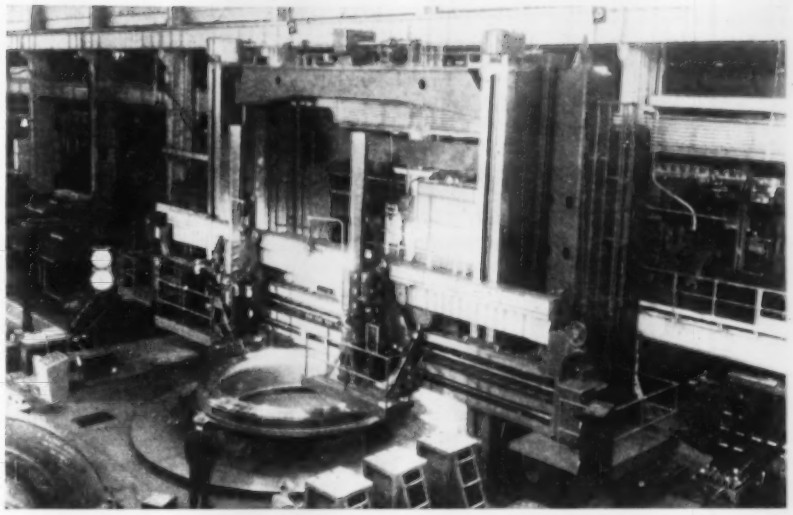
The announcement is to explain what the CMP is, and how it will operate in controlling the flow of steel, copper and aluminum. At the same time orders and regulations to implement the CMP will be promulgated.

The organizational work is under way by a large group at the NPA, directed by Walter C. Skuce, who headed up administration of the CMP in World War II. Mr. Skuce's title in the NPA is Staff Assistant, In Charge of Production Controls Staff Organization.

Ravenna Arsenal Will Reopen

Firestone Tire & Rubber Co. will operate the Ravenna Arsenal, Ravenna, O., which is being reactivated by the Army Ordnance Corps. The arsenal was one of the largest artillery shell and bomb loading plants in the country during World War II.

A survey of work necessary to reactivate the Army depot was made by Firestone and an industrial mobilization planning report made to the Ordnance Department.



BIG OPERATOR: Built by Lima-Hamilton Corp., Lima, O., this 30-foot heavy boring and turning mill is now operating at Allis-Chalmers' West Allis Works. Its cost: $600,000. Single pieces up to 30 feet, 5 inches in diameter and 17 feet high can be machined. The mill is being used to increase Allis-Chalmers capacity for making large generators, condensers and steam hydraulic turbines

Turbine Lab Contracts Awarded

Construction of the Naval Aeronautical Turbine Laboratory at Trenton, N. J., is being speeded with awarding of two contracts totaling over $1 million.

Air valves and controls in the performance test lab will be designed, constructed and installed by Benjamin Lessner Co., Philadelphia, at a cost of $945,000. American Hydrotherm Corp. of Long Island City, N. Y., will build exhaust gas coolers for a turbo prop cell. Its winning bid was $220,600. When completed, the laboratory will run tests at simulated altitudes up to 65,000 feet.

U. S. Steel To Break Ground

Ground will be broken Mar. 1 for U. S. Steel Co.'s new Fairless Works in Falls Township, near Morrisville, Pa. Located across the Delaware River from Trenton, N. J., the steel plant will have an annual productive capacity of 1.8 million tons.

Contract for designing, furnishing and erecting two coke oven batteries of 87 ovens each at the Fairless Works was awarded to Wilputte Coke Oven Division, Allied Chemical & Dye Corp. Combined capacity will be 916,000 net tons of coke annually, in addition to large quantities of gas and chemicals. The facilities will be complete with coal and coke handling equipment and by-product recovery facilities.

Iowa Steel Plant Loan Studied

Government officials are conferring with Iowa industrialists on a $100 million loan application for construction of a steel plant near Clinton. North American Steel Co. of Clinton made the application.

Plans call for production of 1 million tons of finished steel and 400,000 tons of pig iron annually.

The company claims it will make sheet, bar and slat steel directly from iron ore. The proposed plant would be built on 381 acres along the Mississippi river south of Clinton at Comanche, Iowa.

Green River Steel To Build

Two loans amounting to $8,356,000 have been granted to the Green River Steel Corp. for construction of an electric furnace steel plant at Owensboro, Ky. National Production Authority and Reconstruction Finance Corp. will make the advance.

The plant will have an annual ingot capacity of 189,000 tons. It will employ between 800 and 1000 persons after operations begin in less than a year. The corporation has an option to buy a 127-acre site in the center of an area having coal reserves of 55 billion tons.

Clash on New London Mill

Supporters of a proposed $250 million steel mill in New London, Conn., are under crossfire from residents of the affected area. The clash occurred at a hearing before the Judiciary Committee of Connecticut's General Assembly. Industrial and labor representatives approved the proposal. The hearing was held to discuss using the state's right of eminent domain for acquisition of land that would be necessary for the construction of the mill in the town of Waterford.

Under terms of the bill, the state would lease the land to a corporation that would build and operate the mill. A certificate of necessity for the construction has been granted by the federal government, but it carries a 90-day time limit.

Proponents say the mill would lower the cost of materials for the state's important metalworking industries and provide vast employment opportunities. Opposition centers on the eminent domain feature of the bill. It claims the steel mill corporation is a private group and should acquire the land through private means. Quick action by the committee is expected because of the time limit.

Virginia Mill License Sought

Tidewater Industries Inc., a new concern whose backers have not yet been revealed, applied for government certificate of necessity to build a new steel plant east of Richmond, Va., in the James river basin.

Metalworking Companies Granted Necessity Certificates

SEVERAL score additional metalworking and related companies received certificates of necessity for industrial expansion for defense purposes. These grants permit the companies to write off the costs of expansion for tax purposes over a five-year period. Latest certificates granted include:

COMPANY	AMOUNT	PRODUCT OR FACILITY
Jones & Laughlin Steel Corp., Cleveland	$ 3,182,000	Ore unloader
Northwestern Steel, Wire, Sterling, Ill.	12,002,000	Melting stock
Donner-Hanna Coke Corp., Buffalo	2,324,736	Coke ovens
Allied Controls Co., Plantsville, Conn.	91,579	Relays and coils
Quaker Rubber Co., Philadelphia	1,218,553	Rubber goods
Chicago & Eastern Ill. Railway	7,140,000	Cars
Aeroquip Corp., Jackson, Mich.	376,367	Flexible hose
Lehigh Valley Railway	8,535,490	Cars
General Refractories Co., Rockdale, Ill.	548,100	Refractory brick
General Refractories Co., Los Angeles	602,326	Refractory brick
Edson Tool & Mfg. Co., Belleville, N. J.	25,000	Battery boxes
Schaefer Machine Co., Brooklyn	21,385	Aircraft bolts, etc.
Owens-Corning Fiberglas Corp., Newark, O.	750,000	Fibrous glass
S. K. Wellman Co., Bedford, O., & Cleveland	3,678,770	Clutch, brake parts
Cooper Alloy Foundry, Hillside, N. J.	243,358	Not stated
Great Lakes Steel Co., River Rouge, Mich.	18,000,000	Coke ovens
Houdaille-Hershey Corp., N. Chicago, Ill.	640,000	Not stated
Sylvania Electric Products, Boston	1,075,000	Electronics
Grumman Aircraft, Bethpage, N. Y.	88,825	Airplane parts
Parker Appliance Co., Cleveland—Berea, Ky.	412,721	Rubber rings, gaskets
Chesapeake & Ohio Railway	31,587,000	Cars
Kaiser Steel Corp., Fontana, Calif.	24,595,000	Ingots, tin plate
Minneapolis-Honeywell Regulator Co., Freeport, Ill.	650,000	Elec appliances
Mechanical Products Inc., Jackson, Mich.	159,857	Elec appliances
Austenal Laboratories, Rockaway, N. J.	292,850	Aircraft parts
Star Tool & Die Works, Detroit	266,000	Aircraft fixtures
Raybestos-Manhattan Inc., Stratford, Conn.	359,007	Clutch plates
Mexico Refractories Co., Mexico, Mo.	1,409,950	Refractory brick
Struthers Wells Corp., Titusville, Pa.	17,501	Not stated
Seren Tool & Mfg. Co., Cincinnati	2,832	Not stated
Collins Engineering Co., Inglewood, Calif.	95,000	Aircraft hardware
Air Reduction Co., Johnstown, Pa.	562,125	Not stated
Minneapolis-Honeywell Regulator Co., Minneapolis	2,316,618	Electronic equipment
Minneapolis-Honeywell Regulator Co., Minneapolis	3,788,000	Not stated
Crucible Steel Co., Crucible, Pa.	1,127,749	Coal
Crucible Steel Co., Midland, Pa.	3,166,320	Coke
Crucible Steel Co., Midland, Pa.	22,957,824	Ingots, pig iron
Woodward Iron Co., Woodward, Ala.	4,500,000	Pig iron
Dow Chemical Co., Madison, Ill.	27,352,000	Magnesium products
The Dolite Co., Gibsonburg, O.	837,404	Refractory brick
Brooks & Perkins Inc., Detroit	753,500	Magnesium alloy sheets
Alabama By-Products Corp., Tarrant, Ala.	2,418,636	Coke, benzene, tar
American Lava Corp., Chattanooga, Tenn.	712,140	Ceramic cores
Tube Processing Inc., Indianapolis	12,425	Aircraft parts
Keystone Steel & Wire Co., Peoria, Ill.	1,500,000	Ingots
Northwest Magnesite Co., Cape May, N. J.	5,811,091	Dead-burned magnesite
Warren Webster & Co., Camden, N. J.	250,000	Ordnance parts
Island Machine Co. Inc., Farmingdale, N. Y.	45,928	Aircraft parts
Cook Electric Co., Chicago	276,094	Aircraft parts
Aircraft Fittings Co., Cleveland	124,506	Aircraft parts
General Laboratory Associates, Norwich, N. Y.	83,100	Aircraft parts
Gould-National Batteries Inc., Chicago	1,056,500	Batteries
Raytheon Mfg. Co., Waltham, Mass.	2,807,720	Electronics equipment
Armco Steel Corp., Houston, Texas	12,243,981	Ingots, plates
Armco Steel Corp., Houston, Texas	59,275,000	Coke, iron, steel
Armco Steel Corp., Zanesville, O.	1,426,725	Steel sheets
Armco Steel Corp., Middletown, O.	49,046,700	Coke, iron, steel
Sheffield Steel Corp., McAlester, Okla.	10,500,000	Coal
The M. W. Kellogg Co., Jersey City, N. J.	154,084	Not stated
McLouth Steel Corp., Trenton, Mich.	25,350,348	Steel
Massey-Harris Co., Racine, Wis.	1,806,196	Not stated
Apex Tool Co., Bridgeport, Conn.	139,754	Aircraft parts
M. B. Mfg. Co., New Haven, Conn.	108,240	Aircraft fittings
Deutsch Co., Los Angeles	54,334	Not stated
Aircraft Products Co., Clifton Hgts., Pa.	12,354	Machine metal parts

COMPANY	AMOUNT	PRODUCT OR FACILITY
Extruded Hinge Co., Ypsilanti, Mich.	$21,500	Aircraft parts
Glenn-L. Martin Co., Middle River, Md.	76,496	Aircraft
Howard Foundry Co., Chicago	1,222,175	Aircraft parts
Oceanside Machine Shop, Plymouth, N. H.	31,035	Machining
Oceanside Machine Shop, Oceanside, N. Y.	12,584	Machining
Whitney Blake Co., New Haven, Conn.	451,951	Field wire
J. P. Seeburg Corp., Chicago	127,230	Radio apparatus
Deutsch Co., Los Angeles, Calif.	354,179	Aircraft parts
Miller Printing Machinery Co., Pittsburgh	125,000	Gun mounts
Republic Aviation, East Farmingdale, N. Y.	5,348,047	Aircraft
Spencer Wire Co., N. J.	1,215,685	Wire
Blaw-Knox Co., Blawnox, Pa.	50,900	Radio equipment
Detroit Kellering Co., Detroit	103,970	Machining
Allegheny Ludlum Steel, Brackenridge, Pa.	5,266,000	Steel sheets
Macalett Laboratories, Springdale, Conn.	555,000	Electronics equipment
A. O. Smith Corp., Houston	7,605,990	Pipe
Progress Mfg. Co., Philadelphia	14,214	Electronic equipment
Aero Trade Mfg. Co., Mineola, N. Y.	37,000	Aircraft parts
Silent Glow Oil Burner Corp., Hartford, Conn.	30,040	Not stated
Filtrol Corp., Salt Lake City, Utah	2,705,109	Not stated
AVCO Mfg. Co., Williamsport, Pa.	23,468	Aircraft parts
National Water Lift Co., Kalamazoo, Mich.	47,803	Aircraft parts
South Bend Screw Products, S. Bend, Ind.	75,551	Aircraft engine parts
The Wel-Met Co., Kent, O.	412,534	Aircraft parts
McDonnell Aircraft Corp., St. Louis and Robertson, Miss.	1,115,922	Aircraft parts
Cablair Products Co., Culver City, Calif.	64,935	Aircraft parts
Tung-Sol Lamp Works Inc., Bloomfield, N. J.	60,600	Aircraft parts
Marcus Mason & Co. Inc., Westboro, Mass.	83,071	Aircraft parts
Boeing Airplane Co., Seattle	343,107	Aircraft
Seaboard Air Line Railway	16,112,014	Rails
Pittsburgh Steel Co., Monessen, Pa.	56,218,000	Steel, iron
A. P. Green Fire Brick Co., Mexico, Mo.	407,265	Refractories
A. P. Green Fire Brick Co., Woodbridge, N. J.	294,229	Refractories
Sundstrand Machine Tool Corp., Rockford, Ill.	3,177,780	Aircraft parts
Walsh Refractories Corp., Vandalia, Miss.	335,850	Refractory brick
Big Savage Refractories Corp., Frostburg, Md.	581,762	Refractory brick
Axelson Mfg. Co., Montebello, Calif.	1,125,000	Aircraft parts
Pittsburgh Steamship Co.	16,500,000	Lake boats
Bradley Transportation Co.	6,490,000	Lake boats
United Aircraft Corp., Pratt & Whitney Div., E. Hartford, Conn.	19,847,085	Aircraft parts
Sikorsky Div., Bridgeport, Conn.	2,691,105	Aircraft parts
Hamilton Standard Div., Bridgeport, Conn.	2,369,460	Aircraft parts
Lewyt Corp., Long Island, N. Y.	3,194,783	Communications
North American Refractories, Wommelsdorf, Pa.	281,024	Silica brick
Jackson-Hope Towing Co. Inc., Mobile, Ala.	94,350	Barges
The Ironton Fire Brick Co., Ironton, O.	170,000	Refractories
Radio Receptor Co. Inc., Brooklyn, N. Y.	490,000	Electronic equipment
Marsh Steel Corp., Kansas City, Mo.	215,650	Steel warehousing
Bethlehem Pacific Coast Steel Corp., Los Angeles	3,248,000	Ingots, nuts, bolts
Bethlehem Pacific Coast Steel Corp., S. San Francisco, Calif.	362,000	Ingots, bolts
Bethlehem Pacific Coast Steel, Los Angeles	2,123,000	Ingots
Bethlehem Steel Co., Lackawanna, N. Y.	19,034,000	Pig iron, steel ingots
Bethlehem Steel Co., Steelton, Pa.	1,642,000	Ingots, rails
Bethlehem Steel Co., Sparrows Point, Md.	36,401,000	Coke, pig iron, ingots
Bethlehem Steel Co., Lackawanna, N. Y.	56,000,000	Coke, pig iron, ingots
Bethlehem Steel Co., Steelton, Pa.	2,831,000	Ingots, slabs
Bethlehem Steel Co., Sparrows Point, Md.	19,613,000	Coke, pig iron, ingots

Bus Output Won't Slacken

The recent order received by Twin Coach Co., Kent, O., for 1509 Army buses will not seriously interfere with production of motor coaches for private transit customers. Portions of manufacturing personnel and space ordinarily used for the Super Freighter cargo truck department in Kent will be turned over to use for this order. Production of Super Freighters will be reduced somewhat during the present emergency.

Commercial Shearing Buys Site

A 20-acre tract in Salt Lake City has been purchased by Commercial Shearing & Stamping Co., Youngstown, for a $1 million fabricating plant. Intended originally to produce tank heads and steel tunnel supports, the branch will likely be devoted to defense work.

Belt Conveyors, Coal Pipelines—A Start in 1951?

SEEDS may germinate in 1951 for two new and rival modes of transportation.

An Ohio State Senate committee has started hearings on whether a giant conveyor belt proposed to run from the Ohio river to Lake Erie will be given eminent domain. The belt would carry iron ore and coal. Pittsburgh Consolidation Coal Co. will build a $550,000 pilot pipeline system to carry emulsified coal like oil. If the Ohio legislature approves the conveyor belt and if the trial pipeline proves practical, the two lines will be competing in much the same area to haul coal.

Under Fire — The Riverlake Belt Conveyor Lines Inc., to link Cleveland and Lorain, O., with East Liverpool, O., by conveyor belt has been under fire by railroads since its introduction two years ago. Riverlake, backed by Akron, Canton & Youngstown Railroad, seeks legislation classifying it as a public utility so that it can receive eminent domain.

The $210 million conveyor may have a capacity to handle more than 50 million tons of material yearly. About half the material hauled would be coal, half ore.

Testing — Pittsburgh Consolidation's trial coal system will consist of 12-inch line 17,000 feet long, special coal-crushing and preparation equipment and specially designed pumps. It will be near Cadiz, O., at the site of the Georgetown surface mining operation. Preparation of the coal includes washing and crushing to fine sizes, then mixing with water to form a slurry. The slurry is fed into system and moved through the pipeline under pressure.

If successful, the line can be extended to Cleveland. Most of the water will be taken out at the terminal, and the coal will be ready to grind and burn under the boilers of steam plants which already use pulverized coal. Preliminary estimates show that the cost of a dehydrating plant may be about $10 million.

Won't you ride with me, sir?

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

NICKEL—Amendment of Feb. 8, 1951, to NPA Order M-14 prohibits extension of priority ratings to replace nickel used prior to Jan. 1 for the manufacture of stainless steel, high nickel alloy, nickel silver or any other nickel-bearing alloy material. Manufacturers previously had a three-month period in which to replace this nickel taken from inventory. However, ratings can still be extended to replace stainless steel, high nickel alloy, nickel silver or any other nickel-bearing alloy. NPA Order M-14, as amended Feb. 8, 1951. Effective Feb. 8, 1951.

PAPER—M-36 concerns paper for government use. Effective Feb. 8, 1951.

ZINC SCRAP—M-37, which limits zinc scrap inventories and regulates scrap toll agreements, is designed to forestall excessive conversion of scrap into slab zinc at the expense of zinc dust supply. Prohibited are delivery and acceptance of zinc scrap for converting, remelting or handling by other arrangements whereby the owner would retain title after the processing, unless permission is granted by NPA. NPA authorization also is necessary for use of galvanizers' dross for any purpose other than the production of zinc dust. NPA Order M-37. Effective Feb. 14, 1951.

CONSTRUCTION — Amendment 4 to NPA Order M-4 permits construction without NPA authorization of buildings for radio and television broadcasting and for publishing. It also defines an office building. NPA Order M-4, as amended Feb. 9, 1951. Effective Feb. 9, 1951.

Priorities

Delegation 1 as amended Feb. 12, 1951, permits the Defense Department, Atomic Energy Commission, National Advisory Committee for Aeronautics and the Coast Guard to issue defense rated (DO) orders for procurement of commercial office equipment and supplies of certain miscellaneous items. NPA Delegation 1, as amended Feb. 12, 1951. Effective Feb. 12, 1951.

Delegation 8 issued Feb. 12, 1951, authorizes the Department of State to issue defense rated (DO) orders for certain materials to maintain and expand the Voice of America program. NPA Delegation 8. Effective Feb. 12, 1951.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

The maintenance, repair and operating order that NPA has in mind will be a great help to metalworking. Other orders on plates and sheets are in the "think" stage

PROPOSED orders now approaching promulgation by NPA are expected to be of major help to consumers.

The so-called MRO (maintenance, repair and operating), order now in the final screening stage, will entitle every company—whether or not it is in defense or defense-support work—to obtain motors, pulleys, bearings and other products, parts and supplies for maintenance, repair and operation of plants. A special DO rating will be made. Each company will have a ceiling limitation on the amount of MRO goods he may get. To get more, special permission will have to be obtained from NPA. Special DO rating may be used only to get MRO goods; it may not be used to obtain materials or parts going into products manufactured by the company. Furthermore no company operating on rated orders may use a DO rating other than the special DO rating assigned to MRO goods to obtain such goods.

An order still in the "think" stage would set aside a percentage of the capacity of continuous strip mills that would go into plates. That directive would not be made effective until the plate situation becomes tighter than it is.

A Change of Heart?

Do you wonder if the Truman administration sets as much store in labor's friendship as it did before Senator Taft's tremendous majority in last fall's election—that despite allout union opposition? The question rises because of labor's dissatisfaction with current trends in Washington: From where labor sits, almost everything is going wrong. The only recent exception was the appointment of AFL vice president George M. Harrison as a special assistant to Economic Stabilizer Eric Johnston.

Mr. Harrison joined other labor leaders in declaring that the appointment by no means meets labor's demand for a voice in the highest policy councils of the defense program. To satisfy the demand, of course, a top labor man would have to be appointed as a key assistant to Defense Mobilizer Charles E. Wilson—and so far Mr. Wilson has given no sign of making such a move.

Besides the failure of the Office of Price Stabilization to heed the demand of top labor leaders that prices be rolled back to the level of June 1, 1950, the President has failed dismally in coming up with a tax program acceptable to the labor leaders—and they are saying so in blunt language.

NEA

IT JUST CAN'T BE DONE: Testifying before a House Ways and Means Committee is Budget Bureau Director Frederick J. Lawton, explaining where President Truman's $71½ billion budget will be spent. He politely told members that Congressmen who want to cut federal spending by billions of dollars don't know what they are talking about

New Boss for OBE . . .

First expansion of the Defense Production Administration headed by William Henry Harrison is at the expense of the National Security Resources Board. The net effect is to return NSRB to its original function of advising the President. The unit transferred from NSRB to the DPA is the Office of Business Expansion (it acts on applications for certificates of necessity and government loans). Until General Harrison, who continues in the Commerce building, is given quarters for the DPA, the Office of Business Expansion will continue in the Executive Office building adjoining the White House. Byron D. Woodside, director of the Office of Business Expansion continues available by telephone at STerling 4700, Extension 3258.

Awaiting the First Report . . .

Allocation of iron and steel scrap is not expected to develop on any substantial scale until after the NPA Iron & Steel Division's Scrap Section gets its first reports from dealers, consumers and producers—showing February receipts and shipments and inventories at the end of February. The Scrap Section hopes to tabulate the statistical information by March 10, after which it will undertake to develop an allocations procedure in keeping with needs.

The New Look in ECA . . .

Manufacturers contributing their ideas, patents and processes to the re-arming of Europe under the Atlantic Pact are assured of fair compensation from the European firms that use their know-how. Such is the inference from several deals arranged by the State Department for the manufacture of American military vehicles abroad. Though no definite pattern of treatment of the American firms supplying technical assistance has been worked out, previous doubts about fair compensation seem to have been removed.

The big question now under study is: What armaments are to be produced in Europe? To answer this question an Atlantic Pact Defense Production Board is being established in London. This group will decide what is to be made in what countries, after which each participating government will place contracts with firms of its own selection. In general, highly secret weapons will be made exclusively in the United States and Great Britain, and not in areas that could be overrun by the Russians.

The Economic Cooperation Administration—now being changed from a purely economic recovery agency to one in which economic and military objectives are to get substantially equal play—changed markings on its shipments to reflect the new look. Where ECA shipments formerly were labeled "From America for European Recovery," they now bear the words "From America for the Strengthening of Europe."

U. S. Aid to West Europe Changes

ECA dollar grants drop, largely because of the halt in payments to Britain. Privately arranged co-operation may be on the increase

SUBSTANTIAL aid to Western Europe has not been supplied by the U. S. government alone. Vauxhall Motors Ltd. has started producing at a Luton, England, plant partly constructed with steel supplied by the parent company, General Motors Corp.

GM supplied 4300 tons of steel framework to Vauxhall when the English company's expansion program was threatened with curtailment because structural material was not available from any British sources.

GM diverted steel from construction activities in the U. S. GM also lent some of its engineers to help the Vauxhall planning department decide the arrangement of the machine lines and operations.

More Lorries—Vauxhall is spending $30.8 million on modernizing and expanding its Luton facilities. The new 19.5-acre factory started in May, 1949, is now complete and turning out its first products—the heavy Bedford truck and a redesigned line of medium-weight Bedfords. Vauxhall auto engines are to be made in the plant, too. The factory and boiler house cost $6.3 million, equipment about $8.4 million, and the rest of the total will go on other developments during the next two or three years.

The old factory, designed for an output of 35,000 vehicles, produced 84,000 in 1949. The expansion gives 40 per cent more productive space at the site.

Less Money—Now that Britain is no longer receiving ECA funds, Marshall Plan spending has fallen markedly. As of Feb. 7, $1.5 billion has been allotted to West Europe in fiscal 1951, or an average of $6.9 million a day. But since Jan. 1, 1951, when funds to Britain stopped, spending has fallen to $5.5 million a day. Recipient of the most money from ERP thus far in fiscal 1951 is West Germany: $270.1 million. France and her territories received the second largest sum, $195.2 million. Britain is third with $178.2 million and Italy fourth with $131.7 million. As of Feb. 7, Marshall Plan nations had received $10.9 billion since the program started.

Industrial output is now running at more than 130 per cent of the prewar levels in Western Europe. Export volume is also more than 130 per cent of the prewar base. Intra-European trade is 120 per cent or more of the prewar level.

Up and Up—Prices on West Europe's iron and steel are still going up because a new stream of buyers from overseas has come. Even French steel plants have delivery periods of six to eight months now, as in Germany. Periods of ten to twelve months are usual regarding sheets. French, German and Belgian export prices—per metric ton, f.o.b.—are: Merchant bars, $117 to $123; concrete rounds, $122.50 to $127.50; joists, $117 to $122; hot-rolled hoops, $127 to $132; plates $150 to $157; wire rods, $135 to $140.

Europe's ability to export steel is hampered by Germany's falling production, caused by bottlenecks in coal and coke which may continue for another two or three months. Ruhr steel output in January was scarcely more than 1 million tons, far below the record level of last fall. One encouraging note: The new nation mined 10.9 million tons of iron ore in 1950, with an iron content of 2.9 million tons. That compared with 8.5 million tons of ore, with 2.3 million tons of iron content in 1949.

Wide World

CHEAP AT TWICE THE PRICE: Replacing some of the 245,000 housing rooms destroyed in Milan, Italy, during World War II is this low rent apartment. Part of a program that has added 1439 apartments and has 8681 more ready for allocation during its first year, the new homes of three and four rooms are rented for $4 to $5.50 per month. This compares with the privately-built apartments renting for $50 per month up—the minimum rent being nearly a month's salary for the average Italian worker

Canada To Build Jeeps

Jeeps and other automotive equipment costing several million dollars are to be built at plants in Winsdor and Oshawa, Ontario. Orders have been placed with Canadian Commercial Corp., a government-owned purchasing agency, which in turn will negotiate with automotive companies to tool up for production of the vehicles of American design. That country's defense department also is placing orders for American type arms with Canadian Arsenals Ltd., also a government owned company.

Chicago Firm Buys U.K. Company

Independent Pneumatic Tool Co., Chicago, has acquired control of Armstrong Whitworth (Pneumatic Tools) Ltd., Gateshead-on - Tyne, Britain. The deal foreshadows increasing co-operation between the U.K. and the U.S. in the standardization of tools for armament production. Both companies make air powered portable tools used in the manufacture of automobiles, aircraft, ships and in mining and general construction. The property with 750 employees will be managed by Robert G. Faverty, former manager of Thor branches in Chicago and Detroit.

The new regime, which involves no change in policy, aims to increase production and the number of different units being manufactured. Component parts will be exported to the U.S. for assembly by the American company.

Used Machinery Sales Up

Dealers and rebuilders expect a record 1951—if the supply of used equipment holds

DEALERS and rebuilders of used machinery expect a record year in 1951 if the supply of used equipment doesn't dry up.

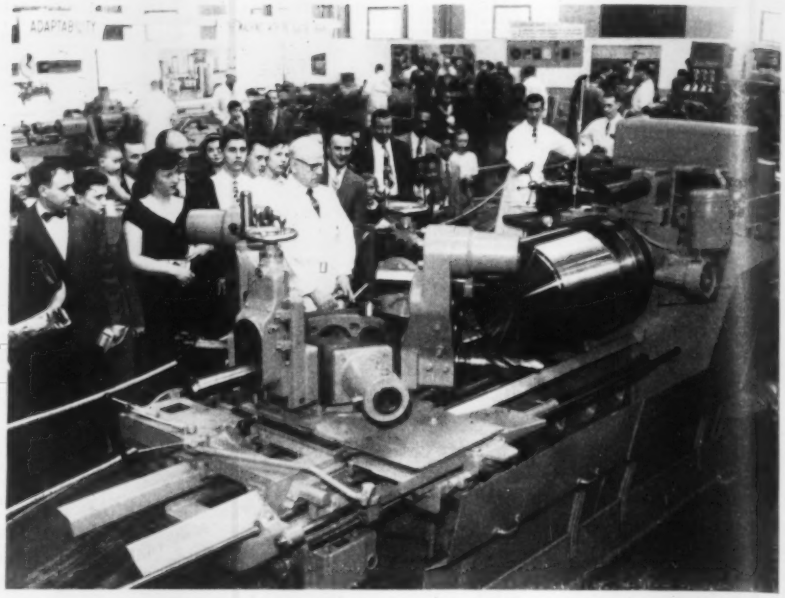
The drought began to appear even in 1950 when the industry had a $175 million volume, double the 1940 level. Used equipment sales usually run about half that of new machinery.

The Big Push The scarcity of new tools is spurring demand for old, particularly standard metal cutting and forming equipment such as turret lathes, die cutters and presses. With an 18 to 24-month wait for some new items, hard pressed manufacturers may even pay more for an eight-year old machine tool than for a new one.

Many of the 940 companies in the business of selling and rebuilding equipment say that the price situation today is as "screwy as at any time in our memory." A year ago, used and rebuilt machines with well known brand names were selling at 40 to 60 per cent of the prices on new machines. Today they are selling at 60 to 90 per cent, at least. Used machines by lesser known makers were selling a year ago at about 25 per cent of the new. Today used quotations on that type of machinery are 75 per cent of the new.

Make Shift Some of the leading machinery rebuilders can't find enough normal business to keep them occupied so severe is the scarcity of equipment suitable for reconstruction and they are modernizing reserve machines to be used by the government for the aircraft program. It usually doesn't pay to rebuild machines unless they were made in 1940 or earlier.

The estimated 10,000 people employed in the used and rebuilt machinery industry face competition when some private companies seek to dispose of their equipment themselves, usually through auctions. But auctions are drying up too. There's one today where there were ten a year ago.



TIME OUT FOR OPEN HOUSE: First employees' open house in eight years at Warner & Swasey Co., Cleveland, helps workers get acquainted with the company's machines. Elaborate working exhibits featuring machine tools, textile machinery and a Gradall multipurpose earthmover were borrowed from busy assembly lines for the occasion. One theme of the party was recruitment. The company is enlisting employees' active aid in securing new workers

Freedom for Textile Machinery

There are no measures in the "works" to put specific government limits on textile machinery production.

That was learned from the National Production Authority by the Textile Machinery Manufacturers Industry Advisory Committee. NPA's statement followed a recommendation by the committee that its industry be permitted to manufacture textile machinery at the present rate until military and essential civilian textile needs are determined.

Conversion at this time to other defense production by the machinery producers may result in failure by the textile industry to meet future defense requirements, committee members pointed out.

The textile machinery industry is reported to be experiencing difficulty in obtaining steel, aluminum and copper, although metal needs for it are small. The industry uses 115,000 tons of steel, 3000 tons of copper and 5000 tons of aluminum yearly.

Military Gages Standardized

Commercial-type plug and ring gages are now standardized and cataloged, says the Defense Dept.'s Munitions Board. The first series of standards, constituting one-half of the total items under development, has been approved for publication. Reduced to 187,000 catalog items are more than 1 million descriptions previously used by the armed forces. Economies will result from elimination of need for individual blueprints and cutting of red tape in placing contracts. Extensive markings and functional descriptions on each gage will be replaced by a catalog number so that the armed forces can all draw from a common source of supply.

Help Coming for Diesel Makers

The diesel engine industry will get help in obtaining materials to produce its engines for highly essential uses, the industry's advisory committee was told by the National Production Authority.

Committee members had expressed concern over shortages of steel, aluminum and other materials. While they do not now have many orders with defense order ratings they expect a substantial increase in such orders soon.

Estimates of materials required for filling diesel engine orders for the rest of the year are being filed with NPA. Also being filed are lists of orders on producers' books. The information, NPA said, will be used in considering materials to be made available for the production of these engines.

We've a Problem, Mr. DiSalle

Capital goods makers expect a shellacking if Economic Stabilization Agency's Price Regulation No. 1 stays as is.

The problem is this: The order's wording states that "your ceiling price for sale of a commodity is the

highest price at which you delivered it during the base period (Dec. 19, 1950, to Jan. 25, 1951)." That works out all right for a manufacturer who requires mere days to make his product, but the stipulation promises to prove unworkable for capital goods makers whose price on a machine delivered in the base period may have been set a year or more ago. Escalator clauses are apparently voided in the order because the regulation provides that "offering price means the price quoted in the seller's price list or regularly in any other manner."

As the law stands now, capital goods prices are frozen for all practical purposes all over the calendar—six months ago for one manufacturer who contracted to build a lathe at that time, a year ago for another or 18 months ago for still another. In almost all cases prices were lower then than now because the costs were down.

National Machine Tool Builders' Association and other capital goods groups are trying to get relief, thus far with little success. Many want the wording to be changed so that list prices during the base period will determine the ceilings, even though delivery of machines ordered during the base period may be months away.

Limits on Hand Tools: Some Want Them, Some Don't

THERE won't be universal welcome for a National Production Authority order establishing standardized types and varieties of hand tools.

Recommendation for such an order was made by the Hand Service Tools Industry Advisory Committee, NPA says, but STEEL learned there are important members of the industry who do not believe such standardization is in order at this time. The standardization would be made ostensibly to conserve critical materials needed for the mobilization program.

Squeeze-Play— That standardization in effect would be a limitation on the type and quality of tools that could be made. What could be produced under this limitation might be something some tool producers are not equipped to make. Placing such a hardship upon tool producers is not warranted in view of the adequacy of supply of hand tools, a representative of one tool company told STEEL.

Any limitation on the supply of hand tools would be a stumbling block in the government's avowed program of trying to keep the civilian economy strong while building up defenses, this tool company official said.

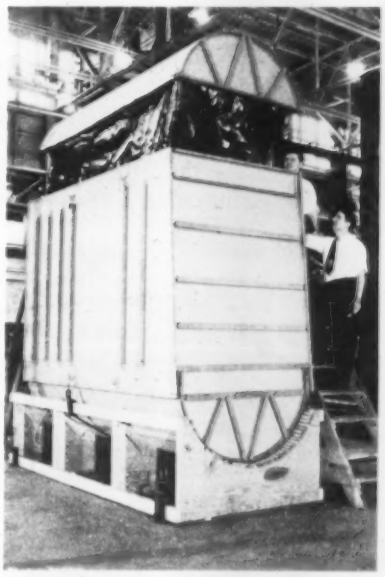
Going Ahead Anyhow—Nevertheless, NPA has appointed a task group from the Hand Service Tools Industry Advisory Committee to submit specific recommendations for standardization of types and varieties, and also to make suggestions for substitutions of less critical materials where possible.

An order limiting the types and qualities of tools was in effect during World War II. The NPA said it was told the revival of such an order would reduce the amount of steel and other materials that would be needed for tool producers' inventories.

Help!— Some industry representatives requested NPA's assistance on an industry-wide basis in obtaining adequate raw material supplies. NPA replied that assistance will be considered in cases of individual hardship.

Hand tool producers want to avoid a cutback in production, for they fear this would result in their loss of skilled workers who later might be needed desperately in event of an allout war.

Representatives of the hand service tools industry told NPA their industry uses less than 1 per cent of the nation's steel, and that its sales total $100 million annually. They indicated they probably can produce $115 million in tools in 1951 without plant expansion, if they can get sufficient materials. They estimated this would fill foreseeable defense and civilian needs.



PLASTIC-PACKAGED GASOLINE: Three thousand gallons of gasoline for the Air Force long range B-36 bomber can be carried in this Pliocel nylon fuel cell. Made of material weighing less than 0.085 pound per square foot, the cell, which fits into a metal shell, is being built in undisclosed numbers by Goodyear Tire & Rubber Co., Akron, O.

Harper Corp. Moves to Buffalo

Offices and plant of Harper Electric Furnace Corp., Niagara Falls, N. Y., are being moved to Buffalo. New and larger quarters are being set up for one-floor continuous flow manufacturing of high temperature electric furnaces and kilns for research and production.

Worthington Gets Transit Works

Overflow from Worthington Pump & Machinery Co. plants will be diverted to the newly purchased Oil City, Pa., plant of National Transit Pump & Machine Corp. Foundry, forge and machine shop facilities are included in the 500,000 square foot plant. In charge at Oil City as assistant to the vice president is William F. Weinreich, former assistant superintendent of Worthington's Buffalo machine shops.

3-M Blast Won't Cut Supply

Customer service on all 3-M coated abrasives will be maintained despite an explosion which damaged the Minnesota Mining & Mfg. Co. mineral plant in St. Paul. Coated abrasive making and converting plants were left intact by the blast. Little difficulty is foreseen because of large established inventories in jumbo and finished form.

Minneapolis-Honeywell Builds

Aeronautical production facilities of Minneapolis-Honeywell Regulator Co. will be doubled by erection of a new plant adjoining its present aviation plant in Minneapolis. Manufacture of electronic automatic pilots for bombers and fighters, electronic fuel gage systems and gyroscopes will be expanded.

Clark Controller Doubles Space

With a $5-million backlog and bright prospects for 1951 business, Clark Controller Co., Cleveland, is doubling its manufacturing space. Acquisition of two buildings adjacent to its present property will provide 75,000 square feet. An additional 50,000 square feet have been leased for immediate use on new assembly work.

Now, more than ever before, America must make full use of its steel-making capacity and conserve its natural resources. Now, more than ever, there is national significance in the phrases, "*Make a ton of sheet steel go farther*" and "*Make your product last longer.*"

These low-alloy, high-tensile steels do "make a ton of sheet steel go farther"—for their inherently higher strength is 50% greater than mild carbon steel. That means, in turn, that 25% less section can be used with safety, and where rigidity is important, this can usually be compensated for through slight design change.

"Make your product last longer" is no idle claim. The much greater resistance of N-A-X HIGH-TENSILE to corrosion, abrasion, and fatigue assures longer lasting products even at reduced thickness.

Explore the potential economies to be derived from the use of low-alloy, high-strength steels—and then specify them. Their use can add materially to our national conservation program.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division, Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

By C. TUTTLE *Detroit Editor, STEEL*

Mirrors of Motordom

Faced with the problem of satisfying demand for glitter and glow, the auto industry is thinking about converting its plating shops to paint shops for decorative trim

DETROIT

DETROIT, center of the electroplating industry, does not yet know what will happen to this important adjunct of normal automotive production. Detroit's job plating shops have increased their facilities to more than four times their 1945 capacity. Size of the captive shops, primarily those operated by General Motors and Ford, is tremendous. Not all activity in them will cease Mar. 1, of course, but many of the largest job shops in the area do nothing but decorative nickel plating, which will be verboten. Many of the platers have no history with zinc suppliers and consequently cannot get this material for bright polishing as an alternate.

Chrome plating of defense materials might partially answer some of the long-range problem, this application being primarily the so-called "hard" chrome which is much thicker than that applied for decorative purposes. The specialists in this type of work, which is used for tools, dies, fixtures, etc., however, have entirely different type of training than is required for bright plating. It is more a question of skill in properly masking the parts to be plated than it is one of equipment for the work.

A few platers have the know-how for both decorative and hard chrome plating. These undoubtedly will have little conversion difficulty, assuming enough of the hard chrome work will be immediately forthcoming. For the rest of the industry, however, there appears to be no answer.

One move which some are studying is to convert their plating shops to paint shops, having first convinced the auto industry of the wisdom of sending out their grilles and similar decorative trim to be finished. This, of course, would require installation in these shops of spray booths and all the other paraphernalia. Many auto builders, however, are already in better position to paint their own parts and may want to use some of their disemployed platers for this job.

Nash Plans Sports Car

Nash Motors Division has an affinity for foreign-built automotive products. Remember the N.X.I. (Nash-Experimental-International) which it had on exhibit a year ago to test public reaction. Proposal was that this car would be built in the United States but would incorporate European engines and possibly transmissions and axles. Now comes a new twist, the Nash Healey sports car with engine and major mechanical parts built by Nash but with bodies built in England with British material.

The new car will be produced in limited quantity until the sports car-mindedness of the American public can be tested. First public showing is at the Chicago Automobile Show this week.

The Nash Healey is powered by a "Dual Jetfire" Ambassador six-cylinder high compression engine. It has overhead valves and is specially equipped with an all-aluminum racing head and other major modifications for high speed operation. Using premium fuel the engine has a compression ratio of 8.1 to 1, developing 125 hp at 4000 rpm. Estimated top speed is 125 mph. It will undergo engineering and speed tests at Daytona Beach, Salt Lake Flats and the Indianapolis Speedway. An experimental version was among the winners of the 1950 Le Mans Grand Prix, averaging 87.6 mph for the 24-hour 2100-mile race.

Seating two people, the car has a wheel base of 102 inches, overall length of 170 inches and width of 66 inches. From road to hood it stands 38 inches. Its front grille follows the design of the Nash "Airflyte" air scoop. Body panels, as well as many structural parts, are of aluminum. The body is built by Donald Healey Co., Warwick, Eng.

Standardization Pays Off

A significant trend in armament design and procurement is the emphasis on standardization. Some of the advantages of this movement are described in Continental Motors Corp.'s annual report issued last week.

President C. J. Reese said a standardized line of air-cooled engines for the Ordnance Dept. had been developed in 1948. Comprising six models ranging from 125 to 1040 hp, four are horizontally opposed and two are v-type. Only two basic cylinders of 4⅝ in. and 5¾ in. diameter, however,

NASH COURTS SPORTS: With the 1951 Nash Healey two-passenger sports car, Nash Motors hopes to break into the sport-racing car field. Twin horizontal British carburetors work in conjunction with an oversized sealed-in Iso-thermal intake manifold

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are used. "All high-mortality parts in each are interchangeable, thus simplifying production and maintenance in front-line service," he reported.

First order with Continental for the V-12 840-hp tank engine, was placed in November, 1948. Shipments started in 1949 and have proceeded at an accelerated pace throughout 1950. The engine powers the General Patton tank. "Their satisfactory performance," he disclosed, "has resulted in additional orders for Continental not only for the 12-cylinder model but also for a second model to power another tank."

Chrysler Builds Tank Engines

It is this 12-cylinder engine for which Chrysler Corp. recently received a contract estimated at $100 million. These will be built at the Michaud plant on the outskirts of New Orleans, which the Army has taken over.

Chrysler Division has begun preparations for engine manufacture at the plant, first move being the appointment of R. S. Bright as general manager. During World War II, Bright was in charge of engine assembly and testing at the Dodge Chicago plant which made B-29 engines. He has been assistant superintendent of the machinery and motor building division of the Detroit Chrysler-Jefferson plant since 1946.

Before production on the Continental-designed engine can begin the New Orleans facility will be completely reconditioned and retooled. Several hundred men are initially required and about 3000 will be employed as production gets under way.

Authoritative sources disclose that the Newark, Del., tank plant which Chrysler has just started to build will be used for the production on two models of tank which as yet have no "M" designation. Under hurry-up orders it is believed the first of these will roll out in eight months.

First Cadillac-built light tank from the Cleveland facility which formerly was the Fisher bomber plant is understood to be scheduled to thunder forth in April, with it and No. 2 which is expected to follow it that month being hand-builts. No. 3, however, is reportedly the first production job.

Buick, K-F Get Engine Orders

Buick and Kaiser-Frazer also figure prominently in this week's preparedness news, both as aircraft engine builders.

Buick's contract to produce the British-designed J65 Sapphire jet engine under license from Wright Aeronautical is, according to Ivan L. Wiles, Buick general manager, "the largest single defense contract Buick ever received." Beyond that comment, however, there is no disclosure as to its actual size. A facilities letter contract for $25 million will permit the acquisition of machinery and equipment for its performance. Wiles said the major portion of parts for the engine will be built at Flint, although the location of assembly and test operations has not yet been decided.

The engine will be used in Republic F-84-F Thunderjets, which GM will build in the Buick-Oldsmobile-Pontiac Kansas City assembly plant. Production is slated for early next year.

K-F will build Wright R-1300 engines at its Detroit Engine Division. This engine which is used in the North American T-28 advanced trainer is a seven-cylinder radial type developing 800 hp. T. A. Bedford, engine division general manager, said that automobile engines will also be produced. More space will ultimately be required for the Air Force contract but no hint where this will be is forthcoming. An estimated 4000 additional employees will be needed.

Kaiser-Frazer has been having a field day, besides the booking of three war contracts in recent weeks. In nine months of production of 1951 models it has already produced more than in any previous model year, at 155,000 units. January sales were the highest for a winter month in the company's history and were 57 per cent above December and five times as great as January, 1950. K-F sales officials also are happily passing around the gold medal award of the Fashion Academy which designated the Henry J the "Fashion Car of the Year."

Auto, Truck Output

U. S. and Canada

	1951	1950
January	667,508*	609,878
February		505,593
March		610,680
April		585,705
May		732,161
June		897,853
July		746,801
August		842,335
September		760,838
October		795,947
November		633,678
December		671,284

Weekly Estimates

Week Ended	1951	1950
Jan. 20	162,485	158,432
Jan. 27	167,869	141,036
Feb. 3	151,206	127,428
Feb. 10	119,189	125,737
Feb. 17	145,000	123,712

Estimates by Ward's Automotive Reports

* Preliminary.

FINISH FIXATION: Painted with actual Ford baked enamel production finishes, 66 scale models show off colors proposed for 1952 Ford passenger cars. Color combinations and contours are studied by L. D. Crusoe, Ford Division vice president, and Randall A. Osmon, color and finish stylist. Models don't represent any future Ford body styles

New L. A. Office for Ford

Ford Motor Co. will build a service parts depot and district sales office building in Los Angeles. The one-story building, to be completed by May 1, will be located on 12½-acre tract and will house about 225 Ford Division employees.

Chrysler Plant To Build J-48s

Participation in the military engine program has disrupted Chrysler's budding plans for realignment of engine-building for passenger cars. The new Trenton, Mich., plant, originally slated to furnish V-8 engines now coming from the Chrysler Jefferson plant, will be turned over to manufacture of the Pratt & Whitney J-48 turbojet engine for aircraft. Meanwhile, finishing touches are being made to an extensive addition to the corporation's Nine-Mile Road plant, although its eventual production status is vague. At one time the reported plan was to move 6-cylinder engine production out of Dodge Main to the suburban location.

The Business Trend

Production picks up speed. Industry tries to return quickly to output levels prevailing before rail switchmen's strike interfered

IT was pick-up week in industry last week. With the railroad switchmen's work stoppage terminated and the flow of materials and parts resumed, industry was picking up speed in its operations and trying to return hurriedly to pre-strike levels.

How much industry accomplished in its recovery move cannot be determined until it completes its reports on the week's operations.

Before this recovery began, industrial production as measured by STEEL's index had fallen in the week ended Feb. 10 to 202 per cent of the 1936-1939 average. That was the lowest level recorded since the New Year's holiday week, when the index was 192. The 202 mark represented a 12-point drop from the week ended Feb. 3.

Each of the two weeks that were marred by the switchmen's strike saw a decline in the index. Just as the strike boiled up the index was touching the highest point of this year, 220 per cent, which was only two points below the postwar high set last October.

Steel: On Recovery List . . .

Steel ingot production, which fell in the week ended Feb. 10 to the lowest level recorded this year, was scheduled to recover by 35,900 net tons last week and total 1,969,000 tons, the American Iron & Steel Institute reported.

Pick-up by Autos . . .

Also recovering last week was automobile production. The rail switchmen's strike had knocked it down in the week ended Feb. 10 to 119,189 passenger cars and trucks, next to the year's lowest level recorded in the New Year's holiday week ended Jan. 6. The 119,189 figure was a drop of 32,017 units from the week ended Feb. 3.

Automobile production losses directly attributable to the rail walkout totaled 60,300 units, says *Ward's Automotive Reports*. There are reports the auto industry will attempt to make up some of the rail losses through overtime work. Such a move may be of limited proportions though in view of the government freeze on prices. The auto industry no longer has the pricing latitude that permits expensive overtime operations.

A Current Gain . . .

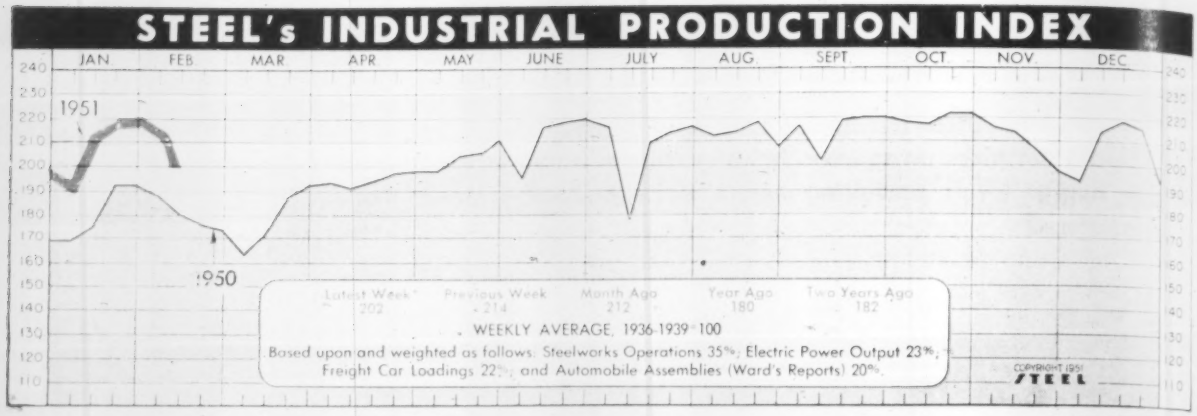
One indicator not knocked down by the rail tie-up is electric power production. It went the opposite way and set a new alltime high in the week ended Feb. 3 by climbing to 7,099,385,000 kilowatthours. Previous record was 7,032,740,000 in the week ended Dec. 23.

Although the general trend of electricity consumption is upward the rail strike might have been reflected in a temporary drop had it not been for such counterbalancing effects as a growing consumption by the aluminum industry and heavy seasonal needs of household heating equipment.

A new record for production of electric energy by electric utilities was set in 1950 when output totaled

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	97.0	101.5	99.0	91.5
	Electric Power Distributed (million kilowatt hours)	7,000	7,099	6,980	5,971
	Bituminous Coal Production (daily av.—1000 tons)	1,587	1,902	1,671	1,090
	Petroleum Production (daily av.—1000 bbl)	5,861	5,938	5,762	4,951
	Construction Volume (ENR—Unit $1,000,000)	$555.7	$235.1	$415.8	$141.9
	Automobile and Truck Output (Ward's—number units)	119,189	151,206	139,679	125,737
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,635; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	700†	651	783	569
	Business Failures (Dun & Bradstreet, number)	191	159	193	195
	Currency in Circulation (in millions of dollars)‡	$27,125	$27,045	$27,415	$26,985
	Department Store Sales (changes from like wk. a yr. ago.)‡	+3%	+25%	+39%	1%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,450	$16,547	$17,198	$14,360
	Federal Gross Debt (billions)	$256.1	$256.1	$256.0	$256.6
	Bond Volume, NYSE (millions)	$23.6	$25.9	$27.2	$18.3
	Stocks Sales, NYSE (thousands of shares)	12,800	14,247	17,362	8,739
	Loans and Investments (billions)†	$69.6	$70.4	$71.2	$67.3
	United States Gov't. Obligations Held (millions)†	$31,557	$32,443	$33,294	$37,595
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL's Nonferrous Metal Price Index‡	262.1	262.2	255.8	159.9
	All Commodities†	182.2	180.9	178.1	152.1
	Metals and Metal Products†	188.9	188.7	187.9	168.5
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1951
1950
Latest Week 202
Previous Week 214
Month Ago 212
Year Ago 180
Two Years Ago 182
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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Week Ended Feb. 10

328,997,875,000 kwhr, a 13 per cent increase over the previous high set in 1949, preliminary figures compiled by the Federal Power Commission indicate.

Coal Output: It Dips . . .

Bituminous coal production, heavily dependent on the supply of railroad cars, was a victim of the rail switchmen's work stoppage. In the week ended Feb. 3, output was 9,525,000 net tons, lowest of the year. Production in the preceding week was 11,410,000 tons. Output so far this year is nevertheless well ahead of production for the corresponding period of last year.

Plant Contracts Dominate . . .

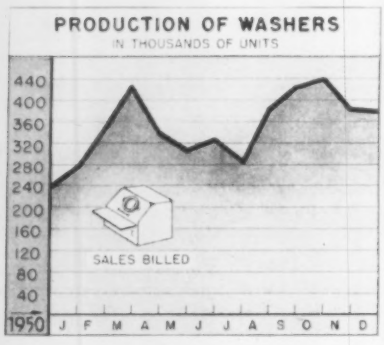
Engineering construction awards continue to be dominated by new industrial building contracts. In the week ended Feb. 8 they totaled $385.9 million, reports *Engineering News-Record*.

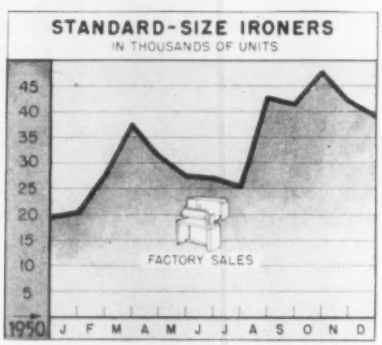
Weather Cools Off Boom . . .

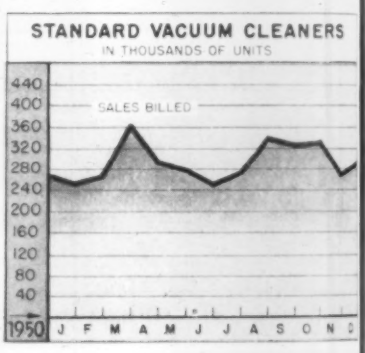
Severe winter weather in the week ended Feb. 3 cooled off the red-hot department store sales boom. As a result, the dollar volume of sales that week was only 3 per cent above that of the corresponding week of last year. Increases have been averaging 25 to 31 per cent.

New High Again for Prices . . .

The government's wholesale price index continued to climb and for the twelfth consecutive week set a new alltime high. Advance of 0.7 per cent in the week ended Feb. 6 hoisted the index to 182.2 per cent of the 1926 average. This level is 5.5 per cent above Dec. 5 and 16 per cent above that which prevailed in the







Household Washers

Sales Billed—Units

	1950	1949	1948
Jan.	275,576	172,400	360,445
Feb.	342,967	201,300	367,909
Mar.	423,802	242,500	408,512
Apr.	333,072	192,500	402,257
May	304,640	211,700	377,895
June	325,217	260,700	392,496
July	282,261	200,900	326,181
Aug.	381,452	323,789	362,169
Sept.	424,043	357,281	433,919
Oct.	439,924	333,728	382,400
Nov.	379,964	298,717	319,300
Dec.	377,013	237,591	183,700
Totals	4,289,931	3,033,106	4,317,183

American Home Laundry Mfrs. Assoc.

Standard-Size Ironers

Factory Sales—Units

	1950	1949	1948
Jan.	26,300	28,300	40,192
Feb.	27,600	28,400	51,651
Mar.	37,800	23,800	53,686
Apr.	31,600	18,100	47,319
May	27,400	19,500	44,954
June	27,100	21,100	32,767
July	25,100	17,700	26,679
Aug.	42,700	32,300	35,203
Sept.	41,400	27,700	37,308
Oct.	47,500	36,045	38,517
Nov.	41,900	35,000	42,000
Dec.	38,800	19,400	26,000
Totals	409,200	307,345	476,860

American Home Laundry Mfrs. Assoc.

Standard Vacuum Cleaners

Sales Billed—Units

	1950	1949	1948
Jan.	249,150	228,769	304,273
Feb.	263,515	241,267	311,448
Mar.	361,014	309,897	356,415
Apr.	292,664	252,656	306,588
May	278,645	222,850	276,657
June	250,190	207,354	256,071
July	279,967	161,920	229,537
Aug.	341,232	219,909	237,202
Sept.	327,524	250,036	280,084
Oct.	331,445	272,520	281,573
Nov.	265,310	253,516	255,080
Dec.	288,756	265,513	273,890
Total	3,529,412	2,886,514	3,360,939

Vacuum Cleaner Manufacturers Assoc.

Charts—Copyright 1951, STEEL

May 24-June 24, 1950, period. Responsible primarily for the increases were rises in prices of farm and food products.

More Radios and TV Sets . . .

Record production of television sets in 1950 did not shove radio production into a back seat. Radio output rose to 14,589,900 from 1949's 11,400,000, the Radio-Television Manufacturers Association reports. Television receiver production in 1950 was 7,463,800; in 1949 it was 3 million.

Freight Car Orders Roll On . . .

The defense-spurred buying of railroad freight cars came close in January to setting a new monthly record for the last quarter century. The 26,356 cars ordered that month were exceeded only by the 30,065 ordered last July.

The January ordering lifted the number of cars on order as of Feb. 1 to 141,758, highest level in history, the American Railway Car Institute and Association of American Railroads announced.

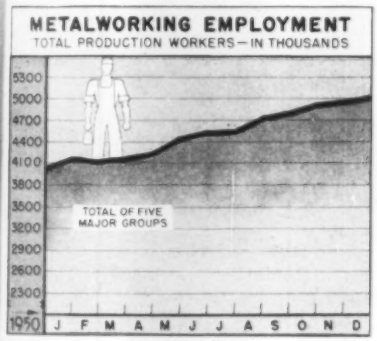
Deliveries of new cars in January increased slightly to 5949, compared with 5700 in December. Beginning with January, 10,000 car-sets of steel are being allocated monthly by the National Production Authority, and production is expected to climb to corresponding levels by April or May.

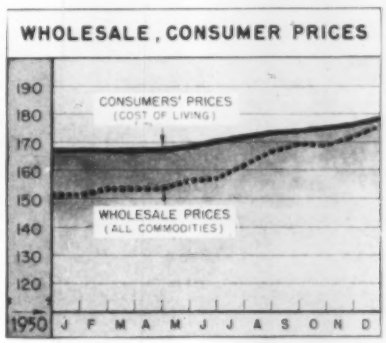
Trends Fore and Aft . . .

Aetna-Standard Engineering Co., Youngstown, producer of steel plant equipment, has the biggest backlog in its 50-year history, $40 million worth, and it's expecting some more big orders shortly . . . New businesses incorporated rose in 1950 for the first time since 1946, the 1950 incorporations totaling 92,925, compared with 1946's 132,916 . . . Manufacturers' sales in 1950 totaled $235 billion, an 18 per cent rise over 1949 . . . Clary Multiplier Co., San Gabriel, Calif., saw its January sales to civilians rise 20 per cent over the January, 1950, level.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction	Feb.5	Gear Sales	Feb.12	Ranges, Elec.	Feb.5
Durable Goods	Feb.12	Gray Iron Castings	Jan.8	Ranges, Gas	Dec.4
Employ., Steel	Jan.29	Indus. Production	Feb.12	Refrigerators	Jan.15
Fab. Struc. Steel	Feb.12	Machine Tools	Feb.12	Steel Castings	Jan.29
Foundry Equip.	Jan.29	Malleable Cast.	Feb.5	Steel Forgings	Jan.29
Freight Cars	Jan.22	Pumps, New Orders	Feb.5	Steel Shipments	Dec.25
Furnaces, Indus.	Jan.22	Purchasing Power	Feb.5	Wages, Metalwkg.	Jan.29
Furnaces, W. Air	Jan.22	Radio, TV	Aug.14	Water Heaters	Dec.25





Metalworking Employment

Production Workers—Five Major Groups

1949	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mch.	Trans Equip.
Dec.	955	688	929	559	896
1950					
Jan.	963	693	937	561	978
Feb.	978	698	960	573	872
Mar.	982	709	981	580	879
Apr.	1,007	722	1,003	595	899
May	1,026	742	1,022	606	1,045
June	1,050	769	1,033	615	1,078
July	1,054	773	1,032	620	1,070
Aug.	1,086	814	1,060	655	1,118
Sept.	1,105	837	1,050	673	1,134
Oct.	1,117	851	1,105	708	1,152
Nov.	1,125	850	1,135	718	1,117
Dec.	1,141	853	1,158	726	1,124

U. S. Bureau of Labor Statistics

Price Indexes

	Wholesale (1926—100)		Consumers (1935-39—100)	
	1950	1949	1950	1949
Jan.	151.5	160.6	166.9	170.9
Feb.	152.7	158.1	166.5	169.0
Mar.	152.7	158.4	167.0	169.5
Apr.	152.9	156.9	167.3	169.7
May	155.9	155.7	168.6	169.2
June	157.3	154.5	170.2	169.6
July	162.9	153.5	172.5	168.5
Aug.	166.4	152.9	173.0	168.8
Sept.	169.5	153.6	173.8	169.6
Oct.	169.1	152.2	174.8	168.5
Nov.	171.7	151.6	175.6	168.6
Dec.	175.3	151.2	178.4	167.5
Average	161.5	154.9	171.2	169.1

U. S. Bureau of Labor Statistics

ON NEW CAPITAL
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New Capital can be raised by means of a loan, a stock issue, or both.

Sometimes a loan may be advisable. Interest cost—that is net cost since interest is deducted before income tax—may be less than half that of dividends on the same amount of capital. There are, however, a great many other factors that must be taken into consideration. There is a fundamental difference between debt and equity capital.

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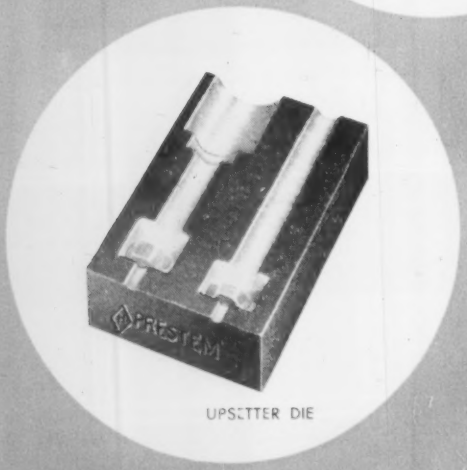


UPSETTER DIE

. . . ANOTHER Heppenstall "FIRST"!

The makers of Hardtem—first prehardened die block for drop hammer forgings—now introduce "*Prestem*", a new steel analysis developed especially for the hot working of steels in forging presses and upsetters.

Prestem is available in the form of blocks and bars for solid press dies, insert dies, upsetter dies, and punches. It machines readily at high hardness . . . has high impact resistance . . . can be water cooled during forging operations.

Results obtained the past year by three large automotive forge shops indicate that *Prestem* dies withstand abrasion and wear at high temperatures . . . resist heat checking during long runs . . . continually produce better quality forgings.

The same steel can be obtained in the annealed condition and is distributed under the trade name *Presneal*. Write for the *Prestem* folder or call your Heppenstall representative for more information. Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.

Heppenstall —*the most dependable name in die blocks*

Men of Industry

WILLIAM A. ROBERTS
. . . new president, Allis-Chalmers

JOHN M. COOK
. . . V. P. Behr-Manning

GEORGE EBERT
. . . controller, Riverside Metal

William A. Roberts, formerly executive vice president in charge of the tractor division, **Allis-Chalmers Mfg. Co.,** Milwaukee, was elected president to succeed the late **Walter Geist. W. C. Johnson,** executive vice president in charge of the general machinery division, was made general executive vice president. Other changes in top executive assignments include: **J. L. Singleton** to succeed Mr. Johnson; **R. S. Stevenson** to succeed Mr. Roberts; **Fred Mackey,** named vice president in charge of manufacturing, general machinery division; **John Ernst,** given a similar position in the tractor division; and **A. W. Van Hercke,** named vice president in charge of engineering.

R. W. Walker, a vice president, Mack Motor Truck Corp., was named executive vice president and a director of **Brunswick Ordnance Corp.,** New Brunswick, N. J., a wholly owned Mack Trucks Inc. subsidiary.

James W. Kinnear Jr. was appointed assistant to vice president-manufacturing, **United States Steel Co.,** Pittsburgh. He returns to U. S. Steel after a four-year absence during which time he was president of Firth-Sterling Steel & Carbide Corp., a position he recently resigned.

Officers of **Automatic Switch Co.,** Orange, N. J., include: **W. F. Hurlburt Sr.,** chairman of the board; **W. F. Hurlburt Jr.,** president; **H. V. Darrin,** vice president and secretary; **David M. Darrin,** vice president and treasurer. Mr. Hurlburt Jr., the new president, was formerly vice president and general manager and continues in the latter position.

John M. Cook was elected vice president, **Behr-Manning Corp.,** Troy, N. Y., and also was named general manager, abrasive division. He was general sales manager. **Elmer C. Schacht** was re-elected president of the abrasives company.

James O. Keene, Keene Steel Co., Detroit, was appointed by **W. H. Ruffin,** president of the **National Association of Manufacturers,** to the latter's newly formed Government Contracts Committee.

Robert W. Lea, who retired as president of Johns-Manville Corp. Feb. 1, joined **Olin Industries Inc.,** East Alton, Ill., of which he has been a director since 1950.

Marvin Friedman was appointed production manager and secretary, **Andrel Products Corp.,** Brooklyn, N. Y.

M. D. Conroy was appointed vice president in charge of industrial relations, and **J. W. Hargate,** vice president in charge of purchasing, **Granite City Steel Co.,** Granite City, Ill. **W. F. Hoelscher** was appointed secretary, succeeding **George B. Schierberg,** who continues as executive vice president and treasurer.

John P. Mansfield, general manager, Dodge-Plymouth assembly plant in San Leandro, Calif., was elected a vice president and a director of the **Plymouth division** of Chrysler Corp., and is transferred to new headquarters in Detroit.

American Swiss File & Tool Co., Newark, N. J., appointed **C. Fred Watkins** general sales manager.

Riverside Metal Co., Riverside, N. J., appointed **George Ebert** controller. Former director of finance, Curtiss-Wright Corp. and for several years executive vice president, Sterling Engine Co., Mr. Ebert was recently with Graef, Cutting & Coit, a Buffalo accounting firm, in an executive post.

Newly elected vice presidents, **Westinghouse Electric Corp.,** Pittsburgh, are: **Tomlinson Fort,** who is manager of the company's headquarters apparatus sales department; **L. W. McLeod,** southwestern district manager at St. Louis; **Emery W. Loomis,** middle Atlantic district manager, Philadelphia; and **L. E. Lynde,** who will head the Washington office. **Julian L. Steffenhagen** was appointed machinery electrification manager, New England.

Robert E. Vance, assistant to the president, **Maytag Co.,** Newton, Iowa, was elected secretary. **F. W. Hubbell** was elected to fill the vacancy on the board created by the death of **W. I. Sparks.**

Wallace B. Phillips was elected president, **Pyrene Mfg. Co.,** Newark, N. J., to succeed **Edward J. Waring,** who upon retirement in August had served for almost forty years as treasurer, vice president and president.

T. V. Cullen is purchasing agent, **Airco Equipment Mfg. Division,** Air Reduction Co. Inc., at Jersey City, N. J. He succeeds **S. S. Stewart.**

Walter Zimmermann was appointed district manager, **Columbia Tool Steel Co.,** Cincinnati, and is in charge of

the tool steel warehouse and office, 2716 Spring Grove Ave., that city. He replaces **James Terry,** resigned.

Orren S. Leslie, formerly with General Motors' Electro-Motive Division,

ORREN S. LESLIE
. . . mgr. Beloit Works, Fairbanks, Morse

has assumed the position of manager of the Beloit, Wis., Works of **Fairbanks, Morse & Co.** to replace **Henry M. Haase,** resigned to take a position elsewhere.

Walter C. Mason was appointed director of personnel for **Arthur G. McKee & Co.,** Cleveland. He resigned his position with E. F. Hauserman Co., where he also served as personnel director.

R. W. Hooker, vice president-sales, Hooker Electrochemical Co., Niagara Falls, N. Y., was re-elected president, **Chlorine Institute Inc.**

Walter H. Haggard was appointed sales representative in New York for **Coal Chemical Sales Division,** United States Steel Co.

A. H. Lewis Jr. was appointed manager of the Syracuse, N. Y., branch of **Crucible Steel Co. of America. H. B. West** was named sales engineer, Syracuse district.

Pacific Airmotive Corp., Burbank, Calif., appointed **Thomas O. McCraney** general counsel and assistant secretary of the firm.

John B. Thorsen was appointed executive assistant at the World Headquarters, New York, of **International Business Machines Corp.**

General Electric Co.'s chemical department, Pittsfield, Mass., appointed **Robert L. Gibson** general manager, and announces new appointments in its plant in Anaheim, Calif., as follows: **J. B. Holmes** will supervise manufacturing; **Henry C. Nelson** will supervise engineering; and **Harry S. Komer** is supervisor of accounting and services. GE's small and medium motor divisions, Schenectady, N. Y., appointed **D. S. MacDonald** sales manager of its newly created gear motor section, gear motor and packaged drive division. In the same division **C. B. House Jr.** will head the a-c motor section and **L. J. Mohler** the d-c motor and generator section of the Lynn, Mass., motor sales division, and **Elliott Harrington** was appointed vice chairman and secretary of its newly established defense projects and priorities committee. **R. S. Walsh** succeeds Mr. Harrington as manager, induction motor sales division.

Howard G. Golem was appointed director of procurement for **Consolidated Vultee Aircraft Corp.,** San Diego, Calif. He was chief of mate-

HOWARD G. GOLEM
. . . Convair's director of procurement

rial for Convair in San Diego. **H. N. May,** purchasing agent, San Diego division, becomes chief of material for the division.

Meritt Myers, production manager, St. Louis domestic range factory, **American Stove Co.,** was named to the newly created post of director of production planning. **E. Lochmoeller** was appointed production manager of the St. Louis division.

Kenneth C. Specht was named manager, trade sales, for **National Lead Co.,** New York, and continues as assistant to the manager of sales, paints, pigments and oils.

W. A. Edwards was appointed district manager, **Trumbull Electric Mfg. Co.'s** East Central district, with headquarters at the Norwood, O., Works. For the last three years he was switch, breaker and control sales manager in the executive offices, Plainville, Conn.

Reginald A. Lenna was elected president, **Blackstone Corp.,** Jamestown, N. Y., to succeed his father, the late **Oscar A. Lenna. Arthur E. Schoback** continues as president, Jamestown Malleable Iron Corp., and as executive vice president of Blackstone, parent company.

Frank L. Hooper was appointed general sales manager, **Kalex Corp.,** with offices in New York.

Robert H. Owens was elected president and general manager, **Roots-Connersville Blower Corp.,** Connersville, Ind., succeeding the late **John Avery. Ralph R. Newquist,** since 1946 vice president in charge of sales, was elected executive vice president. Roots-Connersville Blower Corp. is a subsidiary of Dresser Industries Inc.

Atlas Mineral Products Co., Mertztown, Pa., appointed **Earl Erich** product director of linings and coatings, and announces that **George Kanelis** has joined its engineering department.

David S. Gibson was appointed assistant to the vice president, purchases and traffic, **Worthington Pump & Machinery Corp.,** Harrison, N. J., and **J. J. Llanso** was named general export manager. Since 1947 Mr. Llanso has been a vice president and manager, Worthington Ltd., Buenos Aires, Argentina.

Maurice D. O'Leary, works manager

MAURICE D. O'LEARY
. . . Chicago Vitreous Enamel V. P.

and assistant to the vice president since 1947, was elected a vice president, **Chicago Vitreous Enamel Product Co.,** Cicero, Ill.

Michigan Abrasive Co., Detroit, pro-

EPHRAIM M. DETWILER
. . . mfg. manager of Lamson Corp.

L. W. EVANS
. . . new vice president, Rheem Mfg.

GEORGE P. EXTROM
. . . treasurer, Gisholt Machine Co.

noted **C. H. Wills** from sales manager to director of sales. **B. S. Meade** was made sales manager.

Ephraim M. Detwiler assumes new duties as manufacturing manager for **Lamson Corp.**, Syracuse, N. Y. He was with Worthington Pump & Machinery Co. for many years, and since 1947 was works manager of its Holyoke plant.

Benjamin E. Feeley, formerly with Frederick L. Harrison, industrial engineer, was named production control manager for **Hunt-Spiller Mfg. Corp.**, Boston. He succeeds **R. G. Fredette** resigned.

L. W. Evans and **George W. Fay** were named vice presidents of **Rheem Mfg. Co.** Mr. Evans, manager of engineering since 1948, will be in charge of engineering and development and continues headquarters at the South Gate, Calif., plant. Mr. Fay will be vice president and controller, located at the main office at Richmond, Calif.

S. W. Hickey was appointed assistant manager of railroad products department, **Fairbanks, Morse & Co.**, Chicago.

United States Graphite Co., Saginaw, Mich., appointed **Barry H. Fisher** as sales representative in its Baltimore territory.

Gisholt Machine Co., Madison, Wis., elected **George P. Extrom** treasurer of the company. He has been with the company for nearly 35 years and was acting as assistant secretary for the last ten years.

Joseph Behr & Sons Inc., Rockford, Ill., elected **A. H. Rosenbloom** vice president. Associated with the company for many years, Mr. Rosenbloom has been in charge of the machinery and industrial equipment division.

John H. Clough, president of Fairchild Camera & Instrument Corp., was elected a director of **Griscom Russell Co.**, Chicago.

OBITUARIES...

Robert C. Stanley, 74, chairman of the board and former president, **International Nickel Co. of Canada Ltd.**, New York, died Feb. 12.

John Hughes, 85, formerly assistant to president, **United States Steel Corp.**, New York, died recently. He became associated with the corporation in 1903 as general agent of its then export subsidiary, U. S. Steel Products Co., and retired in 1936. During his entire service with U. S. Steel he was in charge of overseas purchases of raw materials.

W. L. Iliff, 60, manager of eastern sales, **Hyatt Bearings Division**, General Motors Corp., Harrison, N. J., died Feb. 3.

Yellott F. Hardcastle, 67, former vice president in charge of manufacturing, **Pennsylvania Salt Mfg. Co.**, Philadelphia, died Feb. 4. He retired in 1949.

John B. DeWolf, former vice president in charge of sales, **Woodward Iron Co.**, Birmingham, died Feb. 3 in Boston.

Cornelius C. Mershon, 82, retired owner, **Mershon Shaking Grate Works**, Philadelphia, died Feb. 6.

James Darrow, 68, retired superintendent, Joliet, Ill., Works, **American Steel & Wire Co.**, died Feb. 3.

Fred H. Loftus, 56, president, **Loftus Engineering Corp.**, Pittsburgh, and its subsidiaries, died Feb. 10. Before forming the Pittsburgh concerns, Mr. Loftus was chief engineer, secretary and a director of Open Hearth Steel Furnace Co., Chicago, and later was general manager and director, Vulcan Furnace & Equipment Co., Pittsburgh.

Richard H. Collins, 84, automotive pioneer and one of the founders of **General Motors Corp.**, Detroit, died Feb. 4 at his home in Pasadena, Calif.

Charles W. Churchill, 70, president, **Chrysler Corp. Ltd. of Canada**, died Feb. 10 following a heart attack.

Elmer L. Waterman, 53, a production expediter at **Kearney & Trecker Corp.**, Milwaukee, died Feb. 4 of a heart attack.

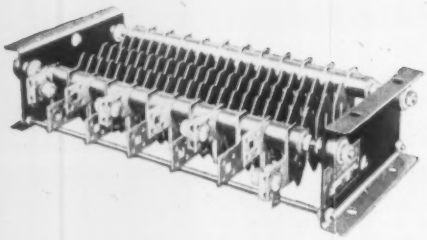
Ralph Lytle, 70, retired chief metallurgist, **Stewart-Warner Corp.**, Chicago, died Feb. 5.

H. L. Saunders, 62, cofounder of **Samson United Corp.**, Rochester, N. Y., died Feb. 2 in Hollywood Beach, Fla., where he was vacationing. He resigned as vice president of the firm in 1940.

Frank P. Sitter, 67, owner, **Sitter Brass & Aluminum Works**, Erie, Pa., died Feb. 4. He retired from active business in 1940.

The welded grid assembly is shown here as a unit resting on narrow iron straps above its end frame, support rods, and spacers.

Stabilized
OHMIC Value
INDEPENDENT OF CLAMPING-NUT PRESSURE
WITH...



Cut maintenance with Bulletin 942-A TAB-WELD Plate Resistors

The alloy-steel used in these plate resistors has negligible resistance-change between cold and maximum working temperatures. In section form, the EC&M TAB-WELD design *maintains the original OHMIC value* of the section, unlike that of any other resistor section. TAB-WELD Resistor Sections are unequalled in that they do *not* depend upon end-clamping nut pressure for a continuous electrical path.

Also, there's *no burning* in concealed areas—at grid-eyes or at tap-plates. Note, too, the convenience of the tap-plates—welded in position. To shift the external lead-wire, only the terminal-block need be moved. The terminal-blocks are grooved to accommodate several sizes of wire, or flat-bus may be bolted to the terminal-plates.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering NEWS AT A GLANCE

ATOMIC POWER CLOSER—What appears to be the first step down the road to commercial power generation by atomic energy is the recent contract signed by Detroit Edison Co. and Dow Chemical Co. with the Atomic Energy Commission. These companies each will designate 15 engineers to work with AEC on the project. Eventually, when plant details are worked out, supplies of fissionable materials will be furnished for reactor piles, with the contractors taking off the power and returning the resulting plutonium to the AEC for use in bombs. The connection of Dow is not too clear, although it may be tied to the disposal of radioactive wastes. Monsanto Chemical Co. has negotiated a similar contract. Incidentally, the AEC plant and property now is valued at close to three billions and is being doubled. About 70,000 are employed on various atomic projects, 5000 by the commission, the rest by operating contractors like General Electric, DuPont and Union Carbide.

PLATING REFINEMENTS—Handling large volume of small parts through electroplating and other surface treatment operations demands specialized types of equipment to keep step with requirements for quantity and quality. Vibratory feeders and automatic under-and-over weigh scales are important components (p. 64) of a continuous bulk plating system installed in the new plant of an Illinois manufacturer of screws, washers, locknuts and related devices.

HYBRID PLANE CONCEIVED—Seventeen companies have submitted plans for a "convertiplane", which can take off vertically like a helicopter and fly forward like a conventional airplane. Air Force and Army have pooled funds for development of such a craft and the proffered designs will be evaluated by the Air Materiel Command. The Air Force, incidentally, has contracted with Loewy Hydropress for two hydraulic presses with capacity in excess of 50,000 tons, which should be fabricating complete aircraft components by early 1952.

TO BUY OR NOT TO BUY?—How to get the most out of dollars earmarked for investment in replacing and expanding production facilities is not the easiest thing in the world to determine. Many formulas have been advanced to develop "figures which will make decisions" on equipment replacement but they do not apply universally and the individual plant operator should go slow in accepting them blindly. A pressed steel plant in the East has drawn up its own system (p. 68) calling old machines *defenders* and proposed new ones *challengers*. Use-hour costs, labor savings and other special factors for each are set down side by side to the end that the most intelligent decision on replacement can be reached.

REVOLUTION IN FINISHES—Probably few persons can recall the tedious operations required 30 years ago to finish an automobile body. Literally weeks of work were devoted to what is now accomplished in a matter of hours and with improved quality. Briefly the old setup was this: The bare body steel first received a priming coat of paint and, when dry, the surface was puttied and glazed to smooth out rough spots. Then followed a surface coat of paint, drying and sanding with pumice and water; more glazing, another surface coat and then a "ground" coat was brushed on. Next followed the first coat of color varnish, often applied with a gravity flow brush, the forerunner of modern spray equipment. More days of drying and more coats of color varnish ensued, with numerous rubbing out operations in between. Finally the body was ready for its coats of clear finishing varnish, each applied by brush. The process required about 26 days in all. Today's lacquers and synthetic enamels provide a superior finish, standing up better under weather and adverse road conditions than the old varnish and applied in a fraction of the time and at a fraction of the cost.

NEW SERIES ON STRIP ROLLING—Separation of theory from practice in the cold rolling of steel has been more apparent in this country than in Great Britain where engineers have been digging into theoretical aspects vigorously and attempting to relate their findings to the operation of experimental rolling mills. Theory and practice appear to agree at one point, to disagree at another. Modifications or corrections of theoretical concepts (p. 76) may be in order.

—*A.H.A.*

CONTINUOUS ELECTROPLATING

Effects Operational Economy

Millions of small stamped fastening devices, preassembled screws and nuts, and twisted-tooth lockwashers are zinc and cadmium plated annually at Shakeproof's new Elgin, Ill., plant. Cleaner operation, fewer rejects and better control of plating thickness are some of the advantages being realized by the operators

A COMPLETE continuous processing cycle for electroplating and phosphatizing is now being utilized by Shakeproof Inc., division of Illinois Tool Works, at its Elgin, Ill., plant. Each automatic process is easily handled by a single operator who performs the only semimanual operation required—that of loading the machine. Operations performed include: Cleaning, plating, rinsing, bright dipping and drying.

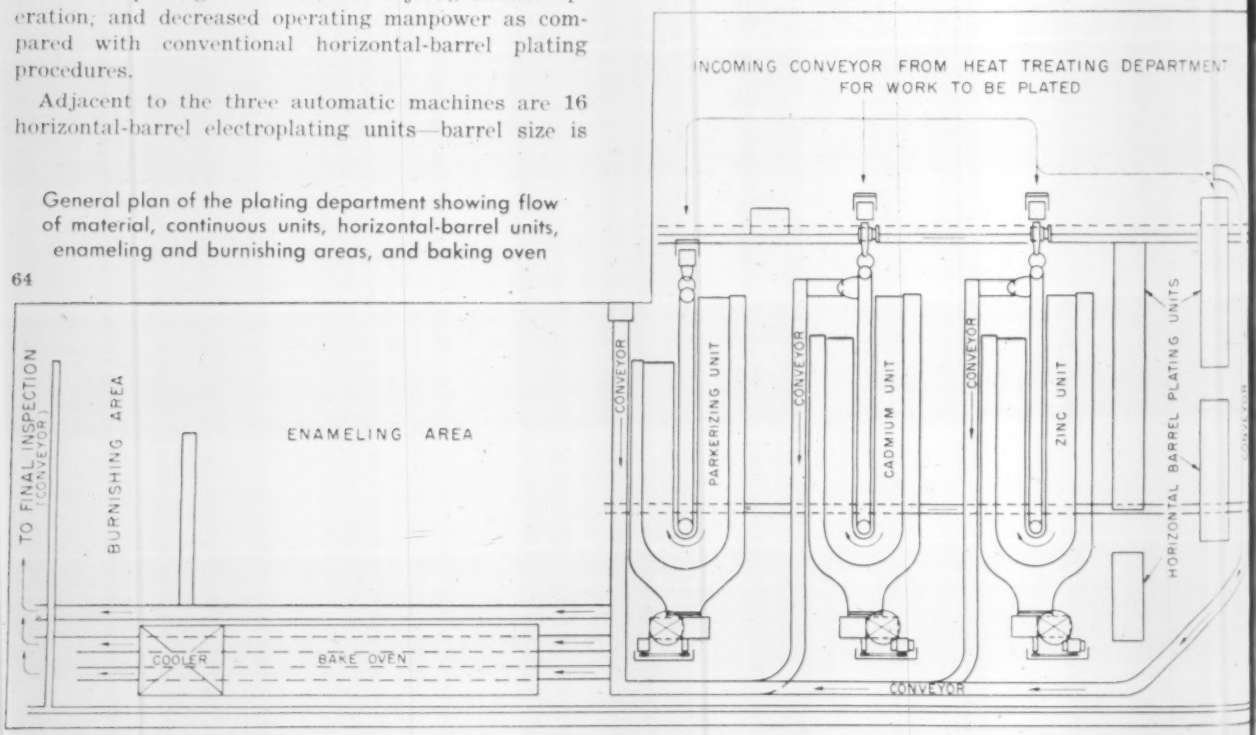
Two F. B. Stevens model C automatic bulk electrolytic plating units are used for zinc and cadmium plating of both heat treated and nonheat treated Sems and Keps (the company's preassembled screws and lock washers, and preassembled nuts and lock washers, respectively), Shakeproof twisted-tooth lock washers, thread-cutting screws, and several hundred other types of small stamped fastening devices. A third Stevens machine is used for phosphatizing—a nonelectrolytic process—those parts requiring such treatment. There is no backtracking of material through the department; it is a straight-flow operation.

Advantages of this type operation include: Better control of plating thickness, less rejects, cleaner operation, and decreased operating manpower as compared with conventional horizontal-barrel plating procedures.

Adjacent to the three automatic machines are 16 horizontal-barrel electroplating units—barrel size is 14-inch diameter by 30-inch length—which are used for the decomposition of copper, nickel, zinc, cadmium, and brass. They are maintained to process normal work in copper, nickel, and brass, the volume of which does not justify automatic operation. Cadmium and zinc are also plated here in small odd lots, in addition to other small lots requiring thicknesses deviating from the normal 0.0001 to 0.0003-inch minimum plated on the automatic units.

Work Weighed Automatically—In operation of the automatic electroplating machines the work for each basket-charge is automatically weighed utilizing a combination of an elevated hopper, Syntron vibratory feeder and automatic under-and-over scale to give an essentially constant work surface area for plating. Work for phosphatizing is manually loaded by means of an elevated hopper and weigh scale to a constant weight per basket. Finished work on the three automatic lines is gravity-unloaded by the machine at practically the same point it was originally loaded.

On the automatic bulk-plating machines, oblique-

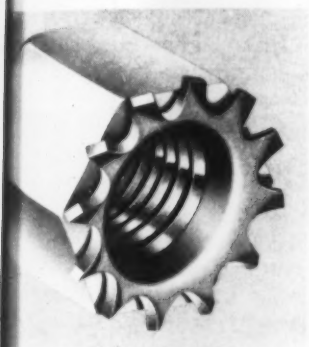


General plan of the plating department showing flow of material, continuous units, horizontal-barrel units, enameling and burnishing areas, and baking oven

DAN REEBEL
Associate Editor, STEEL

Right—At left is hopper, vibratory, and automatic under-and-over weigh scale arrangement for loading the automatic electroplating machine's baskets. One shown in center is ready to receive a measured load of material ready for plating

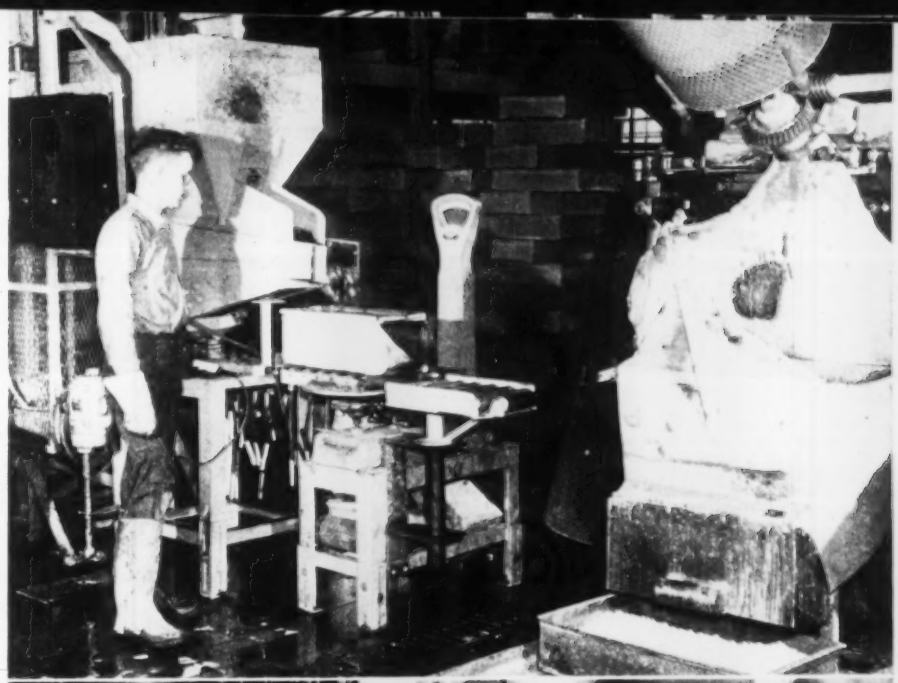
Photography by the author

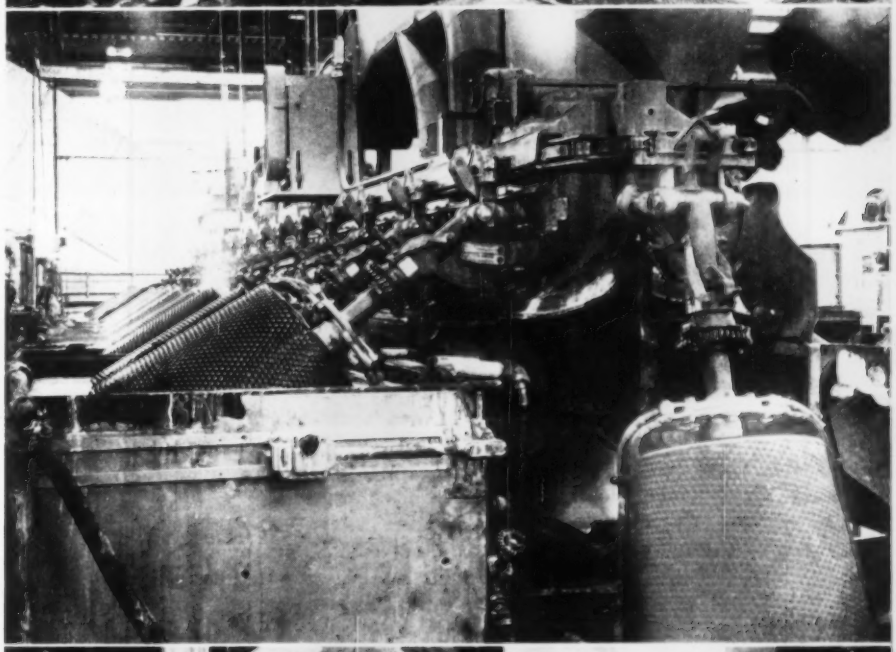


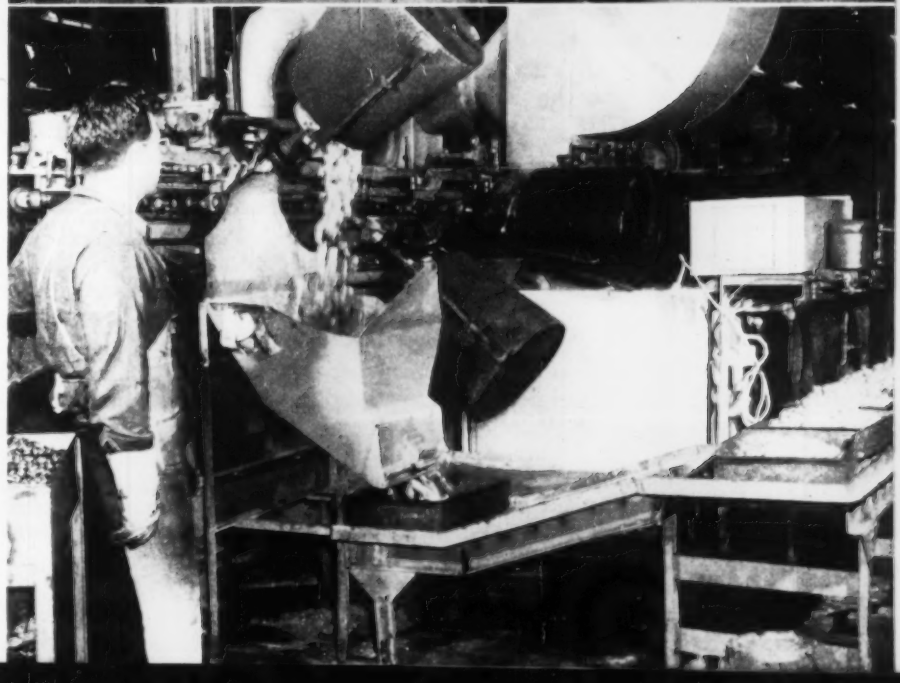
Above—This Keps (preassembled nut and lockwasher) is only one of Shakeproof's many fastening devices plated by the automatic setup

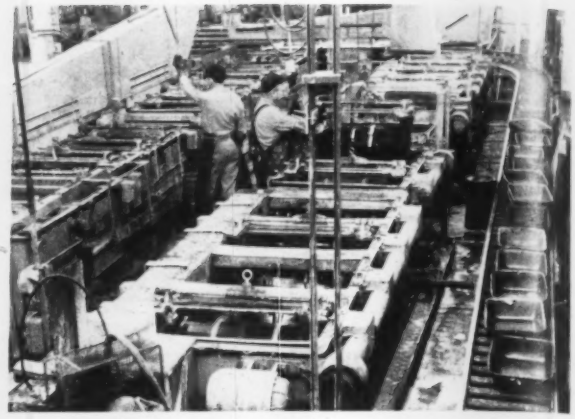
Center, right—First processing tanks, at left, of the continuous machine used for zinc plating. Basket at lower right is at the load position. While in the solutions the baskets are continually revolving

Right—At the unload station the basket rises and the finished plated parts fall into the hopper then down into the waiting shop pan. This is then moved on onto roller conveyor which runs into the baking oven









Above—Work specifying plating thicknesses differing from the normal 0.0001 to 0.0003-inch minimum plated on the continuous units is processed in this horizontal-barrel plating area of the department

Left—These shop pans of plated material are emerging from the discharge end of the baking oven used for relief of any hydrogen embrittlement. They then move up the conveyor at lower left which runs to the inspection department

type insulating barrels are attached to an endless conveyor chain by a basket-spindle bracket assembly. Number of barrels depends upon the size of the machine; in Shakeproof's case it is 27 for the zinc and 25 for the cadmium unit. The conveyor chain is attached to and moves around a central longitudinal frame in 30-inch increments. The baskets and their spindle bracket assemblies are hinged to the conveyor chain so that their vertical movement is controlled by a cam rail upon which the basket supporting rollers rest. By use of hump-type cams the baskets are lifted in and out of the different plating processing tanks as the machine indexes 30 inches to the next station. Time required for indexing is about 25 seconds; dwell period is normally about 1½ minutes. As baskets are lowered into the various tanks, a bronze worm gear located on the basket-spindle bracket assembly meshes with a revolving longitudinal steel worm, and thus the baskets revolve continuously during the dwell period. At the unloading station following completion of the cycle, baskets are raised by the hump-type cams causing the work to fall out into a hopper which feeds by gravity into waiting shop pans. These are subsequently pushed onto a conveyor which transfers them to a Drying Systems oven to be baked for relief of any possible hydrogen embrittlement. This continuous oven—held at 400 F—is 60 feet long; it requires 3½ hours for each pan to move through.

Operational Sequence—Sequence of continuous plating operations for both zinc and cadmium after loading is as follows: Usual alkaline precleaning and neutralizing to remove soils, rinsing, zinc or cadmium plating, rinsing, bright dipping (for zinc ½ per cent nitric acid, for cadmium, chromic acid), rinsing, drying in a hot air blast kept at 250° F, unloading.

Sequence on the continuous phophatizing machine after loading is as follows: Usual alkaline precleaning to remove soils, cold and hot rinsing (hot rinse to heat the work), phosphatizing at 205°F, hot rinsing, hot chromate rinse, drying in a hot air blast at 200° F, and then unloading.

After leaving the bake oven following plating, the pans of plated parts are moved by roller-type conveyor to the final inspection department, then packaged and ultimately shipped.

Machine Finishes Transmissions

Capable of drilling, chamfering, reaming and tapping 32 holes in the ends, sides and tops of 85 automatic transmission housings per hour at 100 per cent efficiency is a special machine tool recently delivered to a large automotive producer.

The Transfer-Matic machine, the name given it by the Cross Co., Detroit, is equipped with automatic devices to transfer parts from one station to the next. Only one unskilled operator is required to operate the machine, part moving automatically from each of the 28 stations to the next station.

First station is for loading and is followed by seven drilling and five idle stations for the ends, one for indexing, and ten drilling and four idle stations for the sides and top. Eighty-three tools are used.

Feature of the machine is the Cross machine control unit with Toolometers, devices that automatically stop the machine when tools need changing. The unit stores preset tools, eliminating downtime adjustments for tool changing. The control board of the machine control unit identifies the station at which tools need changing and enable the operator to group tool changes, thus further reducing downtime.

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

STANDARDIZATION FOR AUTOMATION: On February 5, Cleveland Engineering Society staged its eighth annual Machine Design Conference. It was a sign of the times that this year's theme was "Automation". The fact that many of the 300 men who attended this conference came from far beyond the borders of Cleveland proves beyond the shadow of a doubt that automation is here to stay.

This highly descriptive word was coined by Ford Motor Co. to describe achievements of that company in substituting mechanical hands for human hands in getting work in and out of machines, inspecting it, and transferring it from machine to machine. Therefore, it was logical to have W. R. Slattery of the Ford manufacturing engineering staff to expound the theory and practice of this refined and specialized kind of materials handling.

From what I heard Mr. Slattery say, and from the still and moving pictures that illustrated his talk, my major conclusion was that Ford has done wonders in "hooking together" machines that never were designed to be hooked together. The situation might be compared to that which existed in the railway business prior to standardization of car couplings.

Except in cases of a few machines—mostly special machines—which have been designed so that work feeds through at plant conveyor height—most of the equipment dealt with has demanded special design treatment in the way of mechanical loading, unloading and conveyorizing. A tremendous amount of ingenuity has been involved but the overall impression is that the "steel highways" over which the work travels have the general topography of the picturesque but tortuous road over the Green Mountains from Albany and Troy, N. Y. to Springfield and Windsor, Vt., with which I happen to be especially familiar.

Now that automation has caught on as it has—not only at Ford Motor Co., but also in numerous other production plants both large and small—it looks as if the next big move is up to machine tool and press builders, and builders of gaging machines. Not only are they going to have to build "mechanical hands" onto their machines, but also they are going to have to redesign their equipment so that work goes in one side and out the other side—or in one end and out the other end—it being clamped, moved and unclamped automatically.

Beyond all this, they are going to have to get together on standards as to nature and location of "intake" and "discharge" ports to simplify automatic transfer of work from machine to machine and from end to end of production lines. We may be on the verge of another "revolution in machine tool design".

PROGRESSIVE DIE ECONOMY: One of the earliest widely publicized examples of conservation and efficiency in conversion of raw material into finished products by "production line methods" was not in the automobile industry. Many years before model T Fords began to roll off the Highland Park assembly lines, pork chops and other pork products were rolling off hog "disassembly lines" in the Chicago stockyards—and "everything but the squeal" was turned to some useful purpose.

As long as metals continued plentiful and cheap, meat packers continued to have the edge on metalworkers insofar as percentage of raw material converted into finished products was concerned. Today, however, metalworking executives eye contents of their scrap bins just as critically as the Armours and Cudahys and Swifts eyed their "offal floors" before the turn of the century.

One of the little publicized but highly important ways of "getting more out of metal" is through use of cleverly engineered progressive dies operating on strip metal. This has been driven home to me through a 16-page picture book just published by John Volkert Metal Stampings Inc., Queens Village 8, N. Y., on design engineering, tooling and production under this system.

Among other things, this book follows through the case of a shield base used in huge quantities in the electronics industry. Volkert product engineers were fortunate in being called in on the design of this item. At that stage they recommended minor modifications which in no way affected its functional value but which did mean simplified die construction and maintenance and more effective use of strip brass.

Going on from there, Volkert tool engineers devised a 16-stage sectional progressive die with co-ordinated automatic feed and takeup reel for scrap. Mounted on one double crank press, this assemblage turns out 55 shield bases per minute with one operator. Prior to this from three to six presses and operators were required to meet demands. Cost has been reduced at least 50 per cent.

An interesting point is that this setup puts into practice this time-tried machine shop principle: "Don't let go of a workpiece until every possible operation called for on the blueprint has been performed." These shield bases are trimmed, drawn, blanked, straightened, pierced, necked, formed and dimpled before being cut loose from the slender "skeleton" which—like the pig's squeal—is about all of the strip that remains unused at the end of the line. Proof of any die set is in its performance. To date, this one has produced more than 3,000,000 parts.

"NIP" MACHINE IS NEWS: Ringing a change on the old formula, "When man bites dog—that's news," *Detroit Free Press* of February 12, 1951, reports this startling fact: Japanese-built radial drilling machines now are on sale in the Motor City. In the same issue there is an advertisement featuring this Nipponese machine tool.

Like the cloud on the horizon "no larger than a man's hand", can it be that this small simple machine may be a portent of things to come?

How to Set Up A Successful ... EQUIPMENT

Worcester Pressed Steel wanted to get away from the by-guess-and-by-gosh method of deciding when to expand and replace facilities. Here's their program

By CARTER C. HIGGINS
President & General Manager
Worcester Pressed Steel Co.
Worcester, Mass.

IN ONE corner of our shop, stands a vertical turret lathe which we bought in 1917 for $5400. It is old and slow. Should that lathe, or a number of lathes and presses older than that, be replaced with up-to-date equipment?

No doubt we could save a dollar an hour in direct labor alone by replacing that lathe; but it is only used on a half dozen of our jobs, and this total savings might amount to $250 a year. Today, that won't go very far toward buying new equipment.

Worcester Pressed Steel Co. has set up a plan to see how we can get the most out of the dollars we have to invest for expanding and replacing our facilities. Formulas developed by groups interested in the problem would not seem to apply to our case. We have not been able to develop figures which make decisions, but we are a far cry from basing equipment decisions "on the judgment of the superintendent and the state of business conditions." We have been working toward a way of organizing information. The information is not 100 per cent accurate, for what is the point of measuring a building with a yardstick for the most part and then using a micrometer for the last inch?

The Plant Budget—The annual amount budgeted for plant improvement must be based on the current state of plant equipment, replacement costs, the needs for expansion for new products and techniques, and the money which will be available, including depreciation funds. Our minimum plant budget is based on depreciation plus an amount added for the increased cost of new equipment.

Basis of Comparison—Comparing the present machine (defender) with the best available replacement (challenger) is a useful basic concept. We compare the best of our present machines with the replacement until we reach a point where there is more work than this machine can handle. Then, we compare the next best machine and so on. We cannot collect figures on all our machines, but we can select candidates for replacement by listing all machines, their age, use and condition, and checking off those which are held merely on a standby basis. Supervisory personnel call additional candidates to our attention.

Basic Figures—For records, we need the age, cost, and book value of present equipment, a record of repairs by machine, and figures for productive setup and use hours for both the old machine and for the machine which is intended to replace it. The new machine should pay for itself while it is doing work for which we are paid (in our case, production and setup time). The estimated use hours for the challenger should not exceed the work it is likely to have to do.

When a challenger has faster speeds or larger capabilities than the old one, the annual hours of use on a new machine differ from those on the defender. A group of faster machines may replace a larger group of slow ones, reflecting in use hours for the challenging machines and for the defenders. In duplicating present equipment, a challenger should pay for itself in the marginal additional hours, or in the saving attributable to having two machines in two locations.

Depreciation — The challenger's depreciation is based on original cost divided by life figures which the manufacturer can supply. It's not based on government allowances.

There is a loss of useful life even on an antique defender. We take the original cost of an old machine and divide it by its life to date plus two years in the future. Thus the $5400 machine bought in 1917, would have a defender's depreciation of $5400 divided by 35, or $164 a year . We charge our mistakes to profit and loss (or experience) when we want to replace a machine which is not fully depreciated. In figuring depreciation, salvage is not deducted unless salvage value is going to be over 25 per cent; nor do we charge interest on the funds tied up. We think these figures are usually offsetting.

Before we convert to an annual figure for challenger and defender, we figure depreciation by the use hour. A little study will make it clear that two machines having the same annual depreciation may actually cost quite different amounts per use hour.

Per Use Hour Factors — Loss of salvage value works like depreciation. When we have an offer for a machine which will be lower a year hence, this should appear in the cost of continuing the present machine. If the machine is now valued as scrap, there will be no loss. Likewise an expected price rise on the new machine is part of the cost of continuing as is. Writing off needed major repairs which have to be capitalized is based on a guess as to how much a repair will add to the life of the machine. As applied to the challenger, there is no immediate loss of salvage value or major repairs. This machine may not require any repairs the first year, but we try to use a figure which would be a fair average across at least the first quarter of its life.

Supplies, air, oil, and gas, presumably varying

REPLACEMENT PROGRAM

PRESENT MACHINE #

215 | $2,750 Cost | $1,000 NET Salvage

To also use: # 350 # 305 #

Yr. Prod. Hrs. 960

Yr. Set Up Hrs. 160 Use Hours 1,120

CHALLENGER

Features 215 TONS STRIKING PRESS SINGLE CRANK

Yr. Prod. Hrs. 1,150

Yr. Set Up Hrs. 432 Use Hours 1,582

To do same work, present machine 3,005

USE HOUR FIGURES A

Cost over years plus 2	74.32	.065/HR
Other Basis		
Loss of Salvage Value $		
Major repairs		
Oil, Gas, Tools, Supplies,	$195	.174
Electricity, 2.5¢/HP x	15	.375
Repairs Checkups:	$800	.714
SUB TOTAL		1.328
EFFICIENCY FACTOR		1.90
SUB TOTAL		2.523
Allowance for other machines	2%	= .056

Deprec. $	17,001 / 25 years.	.436/HR
Repairs, Checkups,	$200	.126
Oil, Grease, Tools, Sups. $	200	.126
Electricity 2.5¢ x	30	.750
Extra Ins. and Taxes	132	.083
SUB TOTAL		1,521
SUB TOTAL PRES. MACH.		2.573
± Per Use Hour		1.852
± ANNUAL A		$1,664

LABOR SAVINGS B

$1.70 Prod. labor would cost. $ 3.74 On Present Machine Saving $ 2.04 /Hr.

$1.70 $1.90 Set up labor would cost. $ 3.74 On Present Machine Saving $ .34 /Hr.

Production Hour Savings X Year Production Hours $ 2,346

Set-up Savings X Year Production Saving $ 147

ANNUAL B $2,493

SPECIAL ANNUAL FACTORS C

CASH OUTLAY

Lack of Capacity: Due to:

Extra Scrap, Supervision, Quality: (3 PR) 800

Extra Tool Repairs & Construction: 350

Down Time

Other

Challenger Cost:	$17,001
Installation & Freight	1,017
SUB TOTAL	18,018
Average Invest ___ Yrs.	9,009
	9,009
Realize on Present Mach.	1,000
INVESTMENT	$8,009

EXTRA COST C

= $ 1,664

= $ 2,493

= $ 1,150

Total $ 5,307 GROSS SAVINGS

Taxes $ 2,653 50%

$ 2,653 SAVINGS

INVESTMENT / SAVINGS = $ 8,009 / $ 2,653 = 3 Years.

with the use hours, are required by any machine old or new. We take the hp of electricity required and multiply this by 2.5 cents per use hour. This would include some allowance for demand and power used during repair, sample time, etc. In the case of a challenger, we ordinarily increase our insurance evaluations annually at a cost of 0.775 per cent. Our taxes are not likely to increase.

Efficiency Factors—We now arrive at a subtotal of the use hour costs for the challenger and for the defender. Both can be changed back to annual figures by multiplying by use hours per year, but this would not be accurate. To arrive at true costs, figures should be based on equivalent hours. Thus, if an old machine uses one half as much electrical power as the challenger, but the new machine turns out twice as much work, obviously the cost is the same for the work. The efficiency factor is based on the use hours, both production and setup, on the new machine compared with the number of hours that would be required to do the same work on the defender. A new machine tool twice as fast in production and the same on setting up, would give us an efficiency factor of 1.67 if short runs mean 1 hour of setup for 2 hours of production. By comparing these per-use-hour figures we arrive at a plus or minus savings per use hour, later changed to an annual basis, which appears under heading A on the accompanying data sheet. In the case of a contemplated plant expansion, there is no defender, but the use-hour figures are set up for the challenger only, to compare with the later lack of capacity figure.

Savings on Labor—We come now to figuring the direct labor cost of what the challenger would produce in an hour. Part of labor savings should represent the fringe items directly dependent on wages. To do this, we use, as applicable to our plant, $1.50 per hour for unskilled labor, $1.70 for operators and die setters, and $1.90 for skilled employees. The savings on production and on setup labor are converted into annual figures based on the production and setup hours for the challenger and totalled to give a dollar saving for B.

Special Annual Factors—The picture would not be complete unless consideration were given to other matters which are logical bases for machine replacement. The fact that a milling machine will not take a certain die may well lead to additional cost in subcontracting. When lack of capacity is a principal factor, the basis of judgment is whether the new machine would more than pay for itself during its profitable life while running off the work anticipated for it.

The defender may turn out poor quality work or require additional operations and watching; consequently, a quality figure would recognize extra supervision, extra scrap, and reworking. A figure is required in press fabrication for such extra costs as having to put tools in die sets, and tool repairs which would not be required if the press were in better alignment.

The total of these special annual factors is additional cost of continued operation of the defender, C. They do not exist for the challenger.

We now have the total savings due to the use hour costs, A; labor savings, B; and special annual factors, C, as a guide to the amount we would save by purchasing the challenger.

What About Investment?—We look for a return on our plant investment in dollars. Original investment includes the cost of the new machine, the freight to get it here, and the cost of installing it.

Depreciation deducted from savings is going to cut average dollar investment in half over the life of the machine. The effect of 5-year amortization is not merely a tax saving at a near and certain future with lower deductions later. For the first 5 years, our investment is 50 per cent of original cost; for future periods it is zero, giving us an average investment of 25 per cent on 10-year life, 16.7 per cent on 15-year, 12.5 per cent on 20-year, or 10 per cent on 25-year. Since you still pay out the same dollar amount from savings, and have your money back sooner, we do not recommend charging amortization to use-hour costs.

There may be offsetting income due to realizing some salvage on the old machine; this value is realized if the old machine is disposed of, or reinvested if the old machine is kept for stand-by purposes. It decreases average investment.

Pay-off Period—By dividing average investment by annual savings we find how long it will take to get the investment back. This can also be expressed as an interest return.

An anticipated higher rate of taxes decreases savings and makes it more difficult to reach the required pay-off period. If Americans accept an "excess profits tax" as a good principle with a 75 per cent top bracket, it will double the difficulty of beating the required pay-off period. Such a tax encourages running with your present equipment until, like the deacon's "one hoss shay," it collapses.

Most plants expect to earn a given amount on their average investment. Let us say that this is set at 15 per cent, and you have an indicated pay-off period of 6.6 years or less.

Finally the challenger will have to be replaced; and the usual source of funds to add to an inadequate government depreciation allowance is savings. Labor savings will probably increase along with machinery prices, though other savings items may not keep pace. With machinery prices doubling every 10 years, the required pay-off period might well be somewhat shortened.

Final Decision — The final decision should not be based on the required pay-off period alone, although this is a helpful guide. A shorter period would be required for a special machine bought for a job which might run out; to allow for obsolescence and possible process change; to allow for uncertainty in the figures we have collected, such as on a newly-developed machine, or if the challenger repairs figure may be regarded as on the low side for its whole life; and if cash is tight, or if outlay would mean borrowing.

A longer period is justified: If the challenger represents a certain return over a long life, like guaranteed fuel savings on a boiler; if a major hazard is eliminated; if it encourages breaking into a desirable new market.

GOOD FIXTURES A MUST

for interchangeable machined parts

By ROBERT MAWSON

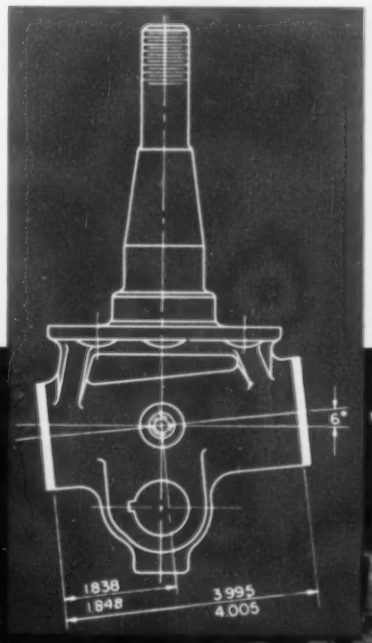
ACCURATE LOCATION of the workpiece and the ability to hold it securely in the jig or fixture are prime requirements in production machining operations. Failure to meet these basic requirements means machined pieces will not be interchangeable at assembly and replacement parts will not fit.

Studebaker Corp., South Bend, Ind., follows this procedure wherever possible or practical. When machining the steering knuckle the drop forgings are first machined on the shank, a 1⅜-inch hole is machined for the king pin and a tapered hole is formed at right angles with the king pin hole. Ends of the surface where the 1⅜-inch hole is machined are then faced. These surfaces are not equally distant from the center line of the forging, one surface being only 1.838-1.848 inches from the center line. Total width is 3.995-4.005 inches.

Spot facing operation is done on a Baker 26 H. O. three station machine. Twelve fixtures are fastened on the table of the machine. These are made with a machine steel locating pin to be a good sliding fit in the 1⅜-inch machined hole in the steering knuckles. Right angle projections on the fixtures, in which the forgings rest, are used to hold the pieces during the machining operation.

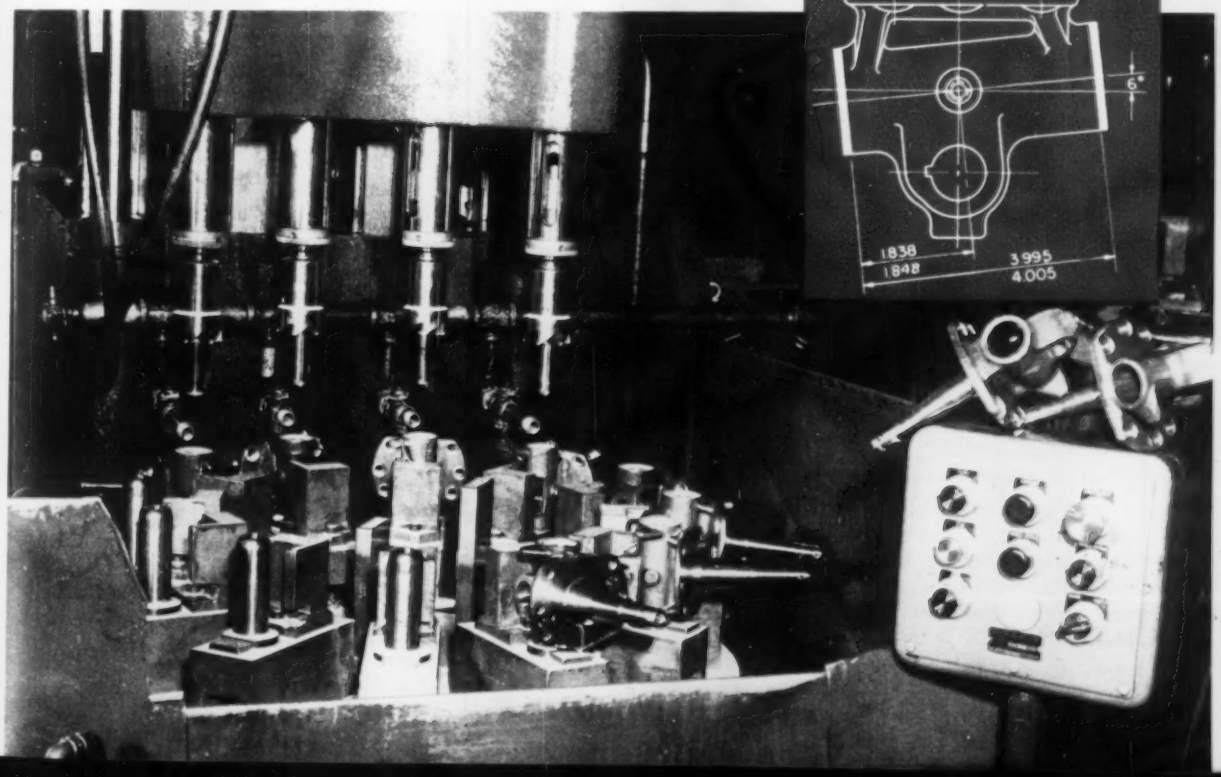
The four spot-facing tools, fitted with pilots, are held in a Buhr four-spindle drill head. As already noted the spot faced surfaces are not equal distance from the center of the forging. To meet this condition a novel machining procedure is used. Two fixtures are marked A; the next two fixtures are marked B; the next two A; etc.

To perform the machining operation with the machine in motion, two forgings which have not been



Below—Operation is performed on a Baker 26 H.O. three station machine. The spot-facing tools are fitted with pilots and held in a Buhr four-spindle drill head

Right—Detail drawing for the spot-facing operation. Lower end is spot-faced first



spot faced are loaded on fixtures A. When the first two steering knuckles return to the loading position, with one side of king pin boss spot-faced they are taken off fixtures marked A and placed on the fixtures marked B to the right of the operator with finish surface down for the final spot facing operation. In other words the fixtures A are used when spot facing the first end and fixtures B when spot facing the second surface.

To compensate for the difference in height of the first and second surfaces the two spot-facing tools for fixtures A are on a higher plane than the two spot facing tools for the fixtures B. Production from this fixture is about 220 steering knuckles finish spot-faced on both ends.

Two-Direction Magnetic Clutch

New design of a magnetic particle type clutch developed by Vickers Electric Division, Vickers Inc., St. Louis, is a reversing or two-speed model. The Magneclutch features a dry magnetic torque medium, electrically controlled and is said to be easily adapted to remote control. Units offer the advantages of torque at zero slip, with virtually no wear on torque transmitting surfaces.

The new model has two driving members and only one driven member. The driving members rotate continuously in opposite directions and a reversing drive which is controlled by energizing the proper excitation coil is achieved. There is reported to be no backlash on the output shaft because of the single low inertia driven member. Gearing arrangement can be made to give a suitable cutting speed in one direction on a machine tool and a faster speed in the opposite direction for return travel.

Company also states that the gear box may be omitted entirely and each of the driving members connected directly to separate sources of power. A further extension of the dual driving member—single driven member design is a two-speed transmission accomplished by driving the input members at different speeds in the same direction. Any slip losses are dissipated in the clutch.

Powder Cutting Speeds Ship Jobs

Such difficult jobs as the cutting of stainless steel door casings for ship boilers, cutting and beveling of brass bars and bronze plates, severing of cast iron sections and cutting of copper pipe into sections are being speeded in a Mobile, Ala., shipyard through the use of powder cutting.

Alabama Dry Dock & Shipbuilding Co. is using an Oxweld C-32 oxyacetylene blowpipe to perform these cutting jobs. Made by Linde Air Products Co., New York, the blowpipe makes use of an iron powder which is carried to it through a tube. Ignition of the iron powder provides the extra heat needed to cut through such metals as those stated above. It is said that the powder-cutting blowpipe will pierce, bevel, and cut most commercial metals with very nearly the same speed that an oxyacetylene blowpipe cuts through carbon steel.

Overhung Driving Pulley Cuts Conveyor Maintenance Costs

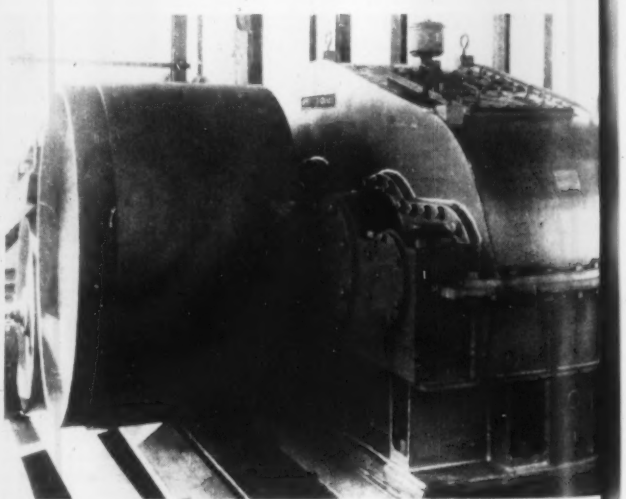
CONSIDERABLE savings in the installation and maintenance costs of heavy belt conveyors are possible with a new conveyor drive developed by National Iron Co., Duluth, Minn. The new drive uses an overhung driving pulley, eliminating the conventional head shaft and its bearings, as well as the low-speed coupling or chain drive. This obviates maintenance on head shaft bearings and the low-speed coupling. The latter has been one of the major sources of belt conveyor shut-downs.

The design uses a special speed reducer built by Westinghouse Electric Corp. It is equipped with an extra large pinion shaft and special antifriction bearings to provide the extra capacity necessary for overhanging the driving pulley. Taper-hardened gearing and pinion shafts, plus fabricated steel housings, make possible the production of a smaller and lighter weight unit.

The first overhung conveyor using this drive was installed on the Iron Range at a net saving of over $8000 in installation cost alon. It is believed to be the first installation of such a conveyor to be made anywhere. A second conveyor installation now is underway.

Because of the open pit mining techniques used, conveyor belts have become increasingly important on the Iron Range. They are the chief means of transporting overburden from the excavation area to the belt site, and carrying iron ore from the pit to the surface.

The first installation was made on a conveyor belt 1075 feet long. The belt is 30 inches wide and the overhung load is 28,800 pounds.



Closeup of overhung driving pulley and special Westinghouse speed reducer. The pulley eliminates conventional head shaft and its bearings, as well as the low-speed coupling or chain drive

NUTONE and REVERE "RING the BELL"!
NuTone SYMPHONIC EIGHT-NOTE WESTMINSTER DOOR CHIME WALNUT FINISH COVER AND BRASS CHIME TUBES.

NUTONE'S Symphonic Door Chime, made by NuTone Incorporated, Cincinnati 27, Ohio. The company has recently added to its line Westminster Chime and Strike Clocks.

EASY polishing on centerless polishing machines is an important feature of Revere Brass Tubes.

POLISHED tubes are dipped in clear synthetic finish and up-ended to drain before baking.

• In the early days of NuTone, when the company was laying the foundation for a business that became the world's largest producer of door chimes, an important decision had to be made. A metal had to be selected for the chimes, one that would produce a soft, pleasant, resonant tone; a metal that was hard and durable; that would polish easily and retain a gleaming, luxurious surface for many years.

NuTone experimented with different metals, tested various products. Finally a Revere Brass Tube was selected, which was not surprising, because Revere itself had conducted extensive laboratory investigations into the factors responsible for pleasing tone. For the past 14 years, throughout NuTone's history, Revere Brass Tube has been used in increasing quantities. Revere has also collaborated in economy as well as quality, assisting on production problems, in the specification of multiple lengths to lessen scrap, and so on. This is a story of cooperation between two industries, and between a large company and one that used to be small, but is now the largest in its field . . . Revere is proud of the results of this long and happy association.

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Forge-Tapered Wing Spars Cut Airplane Weight 50 Pounds

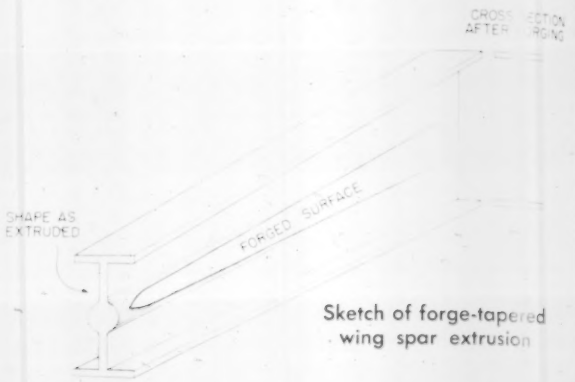
SUCCESSFUL fabrication, on an experimental basis, of forge-tapered aluminum wing spars was recently announced by McDonnell Aircraft Corp. and Aluminum Co. of America. Most important result of the new spar is a 50-pound reduction in weight in the fighter plane for which the spar is made. The weight-saving can be used for additional equipment or for more gasoline to increase the plane's range.

Aluminum Bulb Flattened—Novelty of the new method of wing spar fabrication lies in providing a bulb of aluminum in the web of what otherwise is an I-beam type extrusion. The extrusion is then forged in such a manner that the bulb of aluminum is progressively flattened. After forging, the web tapers from 10 inches at one end to approximately 15½ inches at the other. The result is a forge-tapered extrusion.

Alcoa's Lafayette Works extrudes and the Cleveland Works forges the metal. McDonnell rough machines the forge-tapered extrusion and returns it to Alcoa for heat-treatment and stretching. Then the extrusion goes back to McDonnell for final machining operations.

Length of the spar is slightly over 13 feet. Its final weight is 117 pounds.

Replaces 50 Parts—Ordinarily, spars are made by



Sketch of forge-tapered wing spar extrusion

using two extrusions whose cross-sections resemble T's. Small pieces of aluminum plate are riveted to the two extrusions to make a wing spar which tapers. Many separate operations are required and a great number of rivet joints must be made.

According to Walter F. Burke, McDonnell production manager who conceived the idea, the new forge-tapered wing spar replaces about 50 parts, thus eliminating many of the riveting operations. Because of the unified structure of the forge-tapered spar there is little possibility of joint fatigue. The use of one solid section, made of high strength Alcoa 75S-T6 aluminum alloy, greatly increases the strength of the spar.

McDonnell has applied for a patent on some features of the new method.

High Temperature Refractories

Meeting the need for materials that will withstand the extremely high temperatures demanded by modern industry is a line of high temperature refractory products developed by Norton Co., Worcester, Mass. These new products include stabilized zirconia, catalysts and catalyst supports.

The company is making Crystolon silicon carbide bricks, air-cooled blocks, and other shapes for boiler furnaces as well as shapes for lining water gas generators. All of these products plus those subsequently mentioned were displayed at the recent National Power Exposition in New York.

Some of the catalysts and catalyst supports shown are made of alpha alumina only and others have been impregnated with nickel oxide. Stabilized zirconia shapes are among the company's newest products for use with extremely high temperatures. This new refractory is said to have the ability to withstand the effects of heat in working temperatures as high as 4500° F.

War Grinding Jobs Reviewed

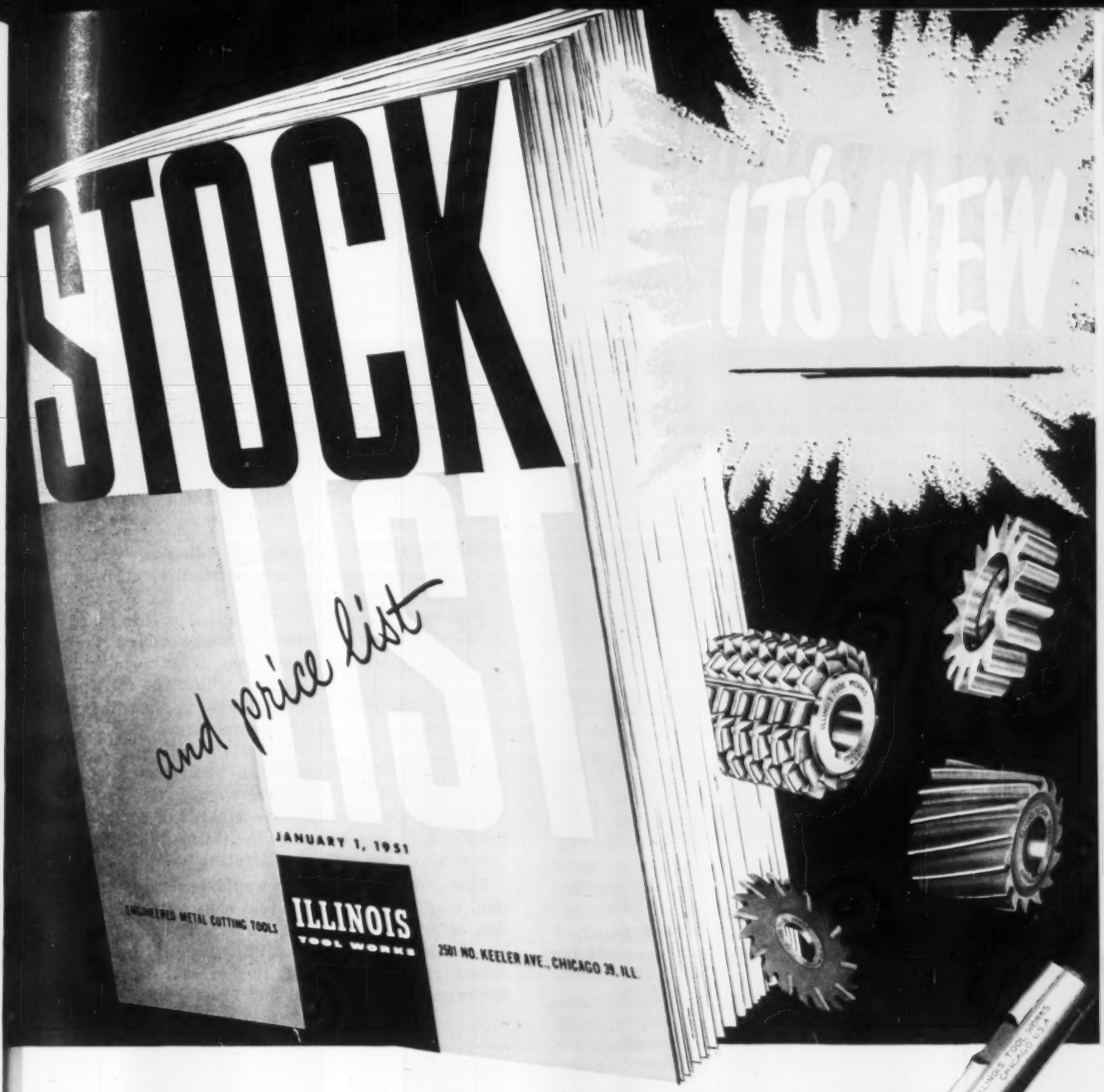
Jobs done on Mattison grinders in World War II are reviewed in a booklet published by Mattison Machine Works, Rockford, Ill. Many jobs performed during the war are again coming up and the company believes hints contained in the pamphlet will help manufacturers in planning for future production.

Illustrated are methods of grinding articulated rods, master rods, airplane engine crankshafts, breechends of gun barrels, breech blocks, breech rings and other military jobs.

Bushing Standards Allow Savings

Replacement of more than 1000 different types of transformer and circuit breaker bushings with only 38 standard bushings of maximum usefulness is announced by the Transformer and Allied Products Divisions, General Electric Co., Schenectady, N. Y. Standardization on fewer bushings results in savings to production, routine engineering and manufacturing departments. These savings permit prices for standard bushings to be 10 per cent lower than for similarly rated nonstandard bushings.

Included are transformer and circuit breaker types rated from 15 to 230-kv inclusive, 1200 amperes and below. All components for standard bushings up through the 161-kv rating will be stocked at the factory, permitting short shipment time and prompt fulfillment of energy requests. This means the user need only keep an inventory of a small number of standard bushings and a few for which no standards are yet available. New apparatus designed and built by GE will have the new standard bushings whenever possible. Almost 100 per cent of all transformers rated below 10,000 kva will use a standard bushing.



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TOOL WORKS

HEADQUARTERS FOR ENGINEERED CUTTING TOOLS

COLD ROLLING STRIP

An appraisal of today's theory and practice

British investigators have been studying this subject for many years and are combining theory and experiment on at least two mills whereas in this country during the past decade interest in the subject has subsided despite improvement in strip mills. In this, the first of a series of articles, the author discusses recent developments in theory and pressure curves

By J. D. KELLER
Consulting Engineer and Partner
Associated Engineers
Pittsburgh

FOLLOWING the remarkable spurt of development of the theory of rolling which extended roughly from 1925 to about 1937, interest in the theory seemed largely to have died down, at least in this country, although a few good papers appeared. But the practical development of the mills continued apace; the rolling speed was at least tripled, roll life and bearing life were lengthened, and great improvements were effected in control. Meanwhile, intensive theoretical and experimental work on the subject was being carried on in Britain, resulting in the classic paper of Orowan[1] in 1943, and more recently in excellent reports by Underwood[2], Ford[3, 4] and Bland[5], and others.

In view of the apparent tendency to increasing separation of theory and practice, it would seem useful at the present time to summarize the developments and define the problems yet unsolved; presenting also some minor extensions of the theoretical complex, newly carried forward by the author.

Theoretical and Experimental Investigations—A correct and complete theory plus the required physical data would permit the pressure, the total force on rolls, and the required torque and energy consumption to be calculated with engineering accuracy for any conditions of rolling. The chief physical data required are the yield strength or "natural flow resistance" of the strip material under the rolling conditions, and the coefficient of friction of the strip on the roll surfaces.

The theory most usually accepted was originated in simple form by Siebel[6], stated as a differential equation by v. Karman[7], and put into usable form by Trinks.[8] It explains the pressure or force relations by the "friction hill" resulting from the flow-restraining effect of the friction at the surfaces of contact of the strip with the rolls. Further increase of pressure due to flattening of the rolls in the region of contact is taken into account by the method developed by Hitchcock and Trinks[9]. The theory is now so well known that it will not be elaborated here, but proposed modifications or corrections of the theory will be discussed.

Neutral Line vs. Region of Adhesion—According to the theory of Siebel or v.Karman, as each section of the strip enters between the rolls, as at point (1) in Fig. 1, its speed is less than that of the rolls, and its surface slips (relatively) backward on the roll surface, against the resistance of surface friction, until a point *O* is reached, at which the roll surface and the strip surface have the same speed. Beyond this point, to the end of the working region at point (2), the strip slips forward on the rolls, and the friction force having reversed its direction tries to hold the strip back. The point *O* where there is no slip, or the line on the roll surface through *O* parallel to the roll axis, was called by the Germans the dividing-line of flow; we call it the neutral line.

This condition of affairs would (with constant friction coefficient) result in a sharp-peaked distribution of pressure on the surface of the roll, as shown by the solid-line curve at the top of Fig. 1. The actual measurements of the pressure distribution, however, made by Siebel and Lueg[10] in 1933, did not

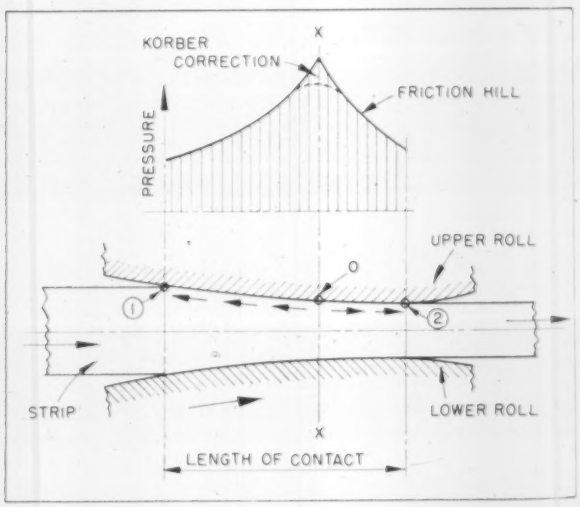

Fig. 1—Diagram of "friction hill" and Korber's correction for pressure of strip on rolls

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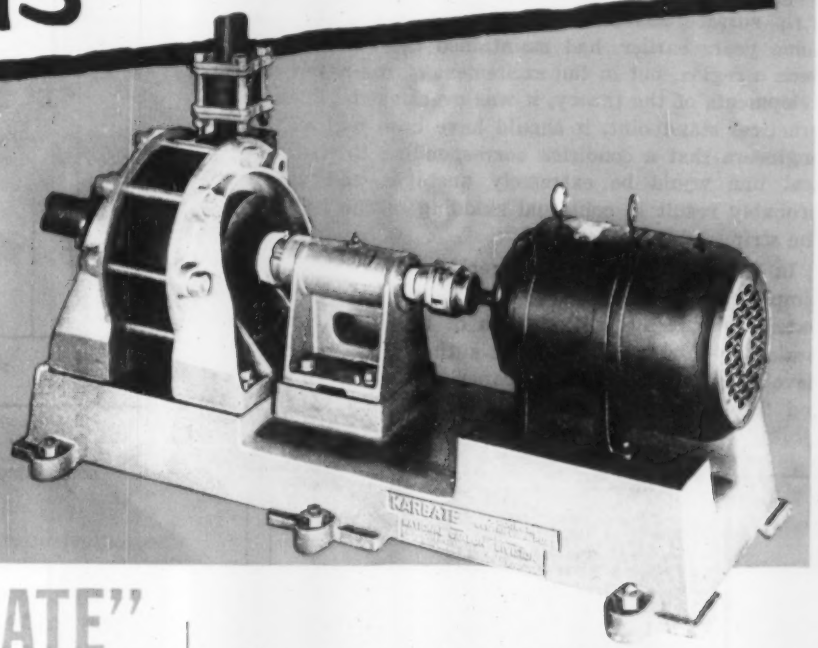

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show a sharp peak; while the curves were more or less concave upward near the beginning and end of contact, in the middle they were humped instead of peaked i.e., the curves had rounded tops. The discrepancy was generally explained by the finite width of the gage block used by Siebel and Lueg, which width was a considerable fraction of the contact length. Nadai[11] as early as 1939 recognized that this might not be the whole explanation, and stated his belief that instead of the neutral line, there must exist a region of finite width near the middle of the contact length in which no slippage occurs but, instead, the strip surface adheres to the roll surface. Ekelund, some years earlier, had maintained the existence of such a region, but in the excitement of the newer developments of the theory, it was overlooked. From a practical standpoint, it should have been realized by engineers that a condition corresponding to the neutral line would be extremely unstable, and would probably result in continual skidding of the rolls on the strip.

In 1940, Korber and Eichinger[12] by making certain simplifications worked out the mathematics to the extent of calculating the width of the region of adhesion or no-slip. The present author learned of this development after his 1942 paper[13] had been submitted for publication and immediately prepared a revised illustration taking Korber's correction into account, but because of conditions beyond control the old incorrect illustration was published instead.

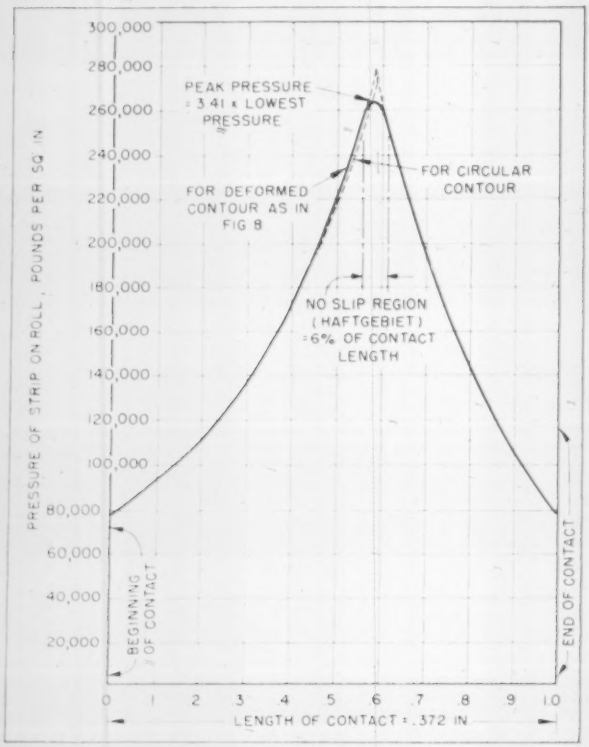

Fig. 2—Corrected pressure-distribution curve for pass No. 5 of Keller paper, STEEL, Sept. 14, 1942. Initial thickness leaving pass, 0.026-inch. Deformed contact length, 0.372-inch. Yield strength of strip at entrance, 94,000 psi; at delivery, 99,500 psi. Back tension, 16,500 psi; front tension, 21,900 psi. Diameter steel work rolls, 16 inches. Friction coefficient taken to be 0.105

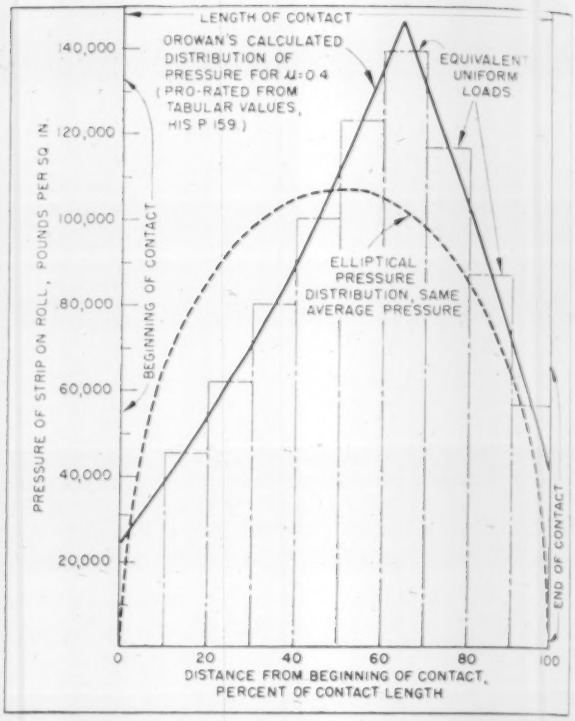

Fig. 3—Peaked pressure-distribution curve used in calculating deformation of roll surfaces

Orowan in 1943 developed the region of no-slip theory along similar lines to Korber but evidently independently, and carried it further in more direct application to the rolling process. Korber's mathematical equations are given in Appendix A, for the benefit of those who may wish to go further into the matter.

Action in No-Slip Region—What happens in the region of no-slip is that the surface layers of the strip, in direct contact with the rolls, remain static thereon, but shearing deformation occurs throughout the thickness of the strip; the material near the middle of the strip thickness is extruded both forward and backward from this region. Thus, adhesion to the rolls can occur only in a region near the middle of the contact length, where the pressure is so high that the friction forces at the surface can exceed the shearing strength of the strip material.

The presence of the region of no-slip results in a rounding of the top of the pressure distribution curve or "friction hill", as indicated by the broken-line curves in Figs. 1 and 2.

This change in the theory is of great importance when the coefficient of friction between the strip and the roll surface is large, as in temper mills and to some extent in hot strip mills; but in cold-reducing mills where the strip and the roll surfaces are lubricated and the coefficient of friction is low (usually between 0.06 and 0.11) the effect is almost negligible. For a typical pass, namely No. 3 of the author's 1942

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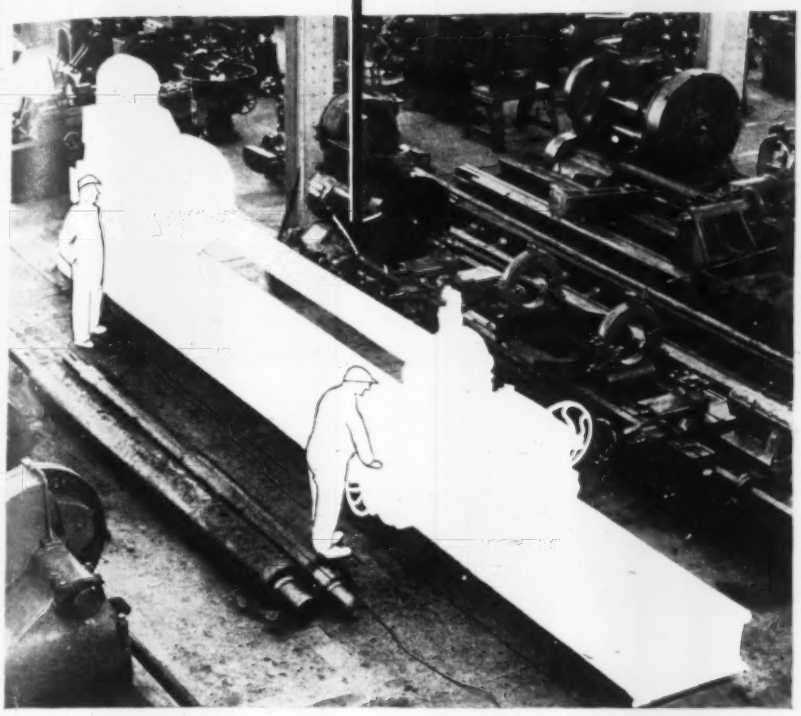

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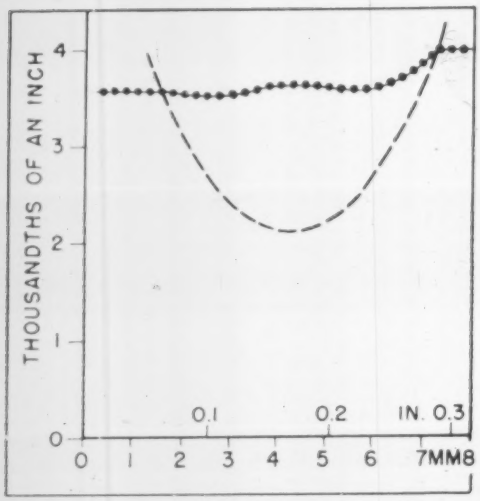

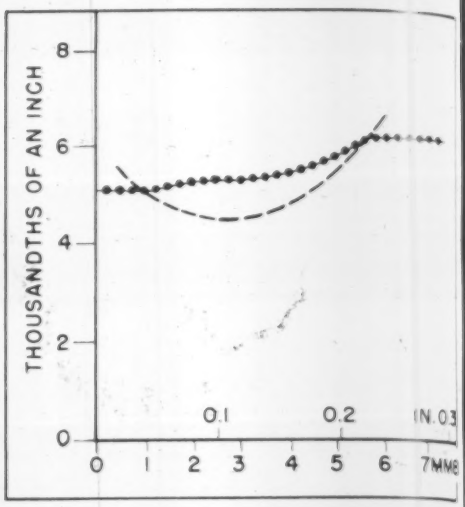

Fig. 4—Orowan's measurements of strip in experiments on roll flattening. a. (left) Brass strip (his specimen c_1); b. (right) Mild steel strip (his specimen c_4). (From Proc. Inst. Mech. Eng., v. 150, 1943, pp 164-165)

paper[13], as shown in Fig. 2 the region of no slip extends over only about 6 per cent of the contact length.

Effect of Shape of Pressure-Distribution Curve on Deformed Contour of Rolls—E. Orowan, as the result of ingenious theoretical and experimental work[1], raised considerable doubt as to the correctness of calculations of roll pressures and power consumption based on the assumptions of the Hertz-Hitchcock equation for roll flattening. Orowan did not question the general conclusion that the actual length of contact of the strip on the rolls is increased over the nominal contact length, often to a great extent, as a result of flattening of the rolls by the pressure exerted on them by the strip. He concluded, however, that the peaked form of the pressure-distribution curve would distort the contour of the roll surface in the contact region, from the circular shape which it should have according to Hertz and Hitchcock, even to the extent of producing an actual indentation or concavity in the roll surface (Figs. 4 and 5); and this in turn would react on and greatly modify the shape of the pressure curve.

The Hertz derivation applying to deformation of two elastic bodies in contact, under pressure, led to the conclusion that the curve of pressure distribution over the contact length is a semiellipse. In rolling, however, there is the contact of a plastic body, the strip, with an elastic one, the roll. Hitchcock in his adaptation of the Hertz equations to these conditions assumed that so long as the *average* pressure is the same, neither the length of contact nor the shape of the deformed contact surface of the roll would be affected appreciably by the fact that the pressure distribution is like the solid-line curve in Fig. 3, instead of Hertz' semiellipse as shown in broken lines. This is what Orowan questioned.

Employed Experimental Method—Concluding that little was to be hoped from mathematical treatment at present, Orowan used the experimental method. In a mill with steel rolls of 8 inches diameter, he rolled strips of brass and of mild steel without a lubricant, stopped the mill with the strip between the rolls, then quickly released the roll pressure and removed the strip. The shape of the surface of the strip, in the part which had stopped in contact with the rolls, was determined by measuring the thickness of the strip, at short intervals along the length, using a ball-point gage reading to 1/10,000-inch. Results for a brass and a mild steel strip are shown in Figs. 4-a and 4-b, respectively (Orowan's Figs. 23 and 24), in which the undeformed contour of the roll is shown by the broken line; the reason why the latter looks like an elliptical instead of a circular arc is that the vertical scale has much greater magnification than the horizontal scale.

Assuming that the strip contours thus obtained represented, in reverse, the deformed roll contours in the contact region, Orowan's conjecture as to the effect of the peaked pressure curve seemed to be fully confirmed. On the basis of these results, he concluded that with thin strip, a definite indentation occurs in the roll surface near the middle of the contact length, and that this acts in such a way as to make a roll of large diameter equivalent to two smaller rolls, thereby greatly reducing the roll pressure and the power consumption.

These extreme conclusions do not seem reasonable. In the first place, it is hard to see how the indentation of the rolls could exceed that which would reduce the slope of the roll surface to a horizontal tangent, at any point (contour shown by solid lines in Fig. 5.) The latter condition might occur, but if it did so, then no compression of the strip would be occurring at the place where the tangent was horizontal—point A in Fig. 5—and the pressure at this place should drop, or at least cease to rise. But this would mean either a flat top or more probably a depression instead of a peak in the pressure curve, and accordingly there should be no indentation in the roll surface. The two conditions, namely, peaked pressure curve and horizontal tangent to the roll surface, do not go together.

Strip Undergoes Re-expansion—The shape of contour in Fig. 4-a, or the broken lines in Fig. 5, would be even more difficult of reasonable explanation. The strip after being compressed to a certain thickness

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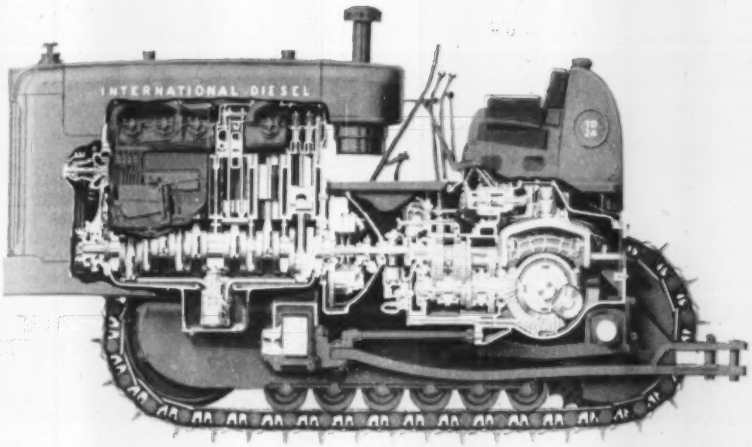

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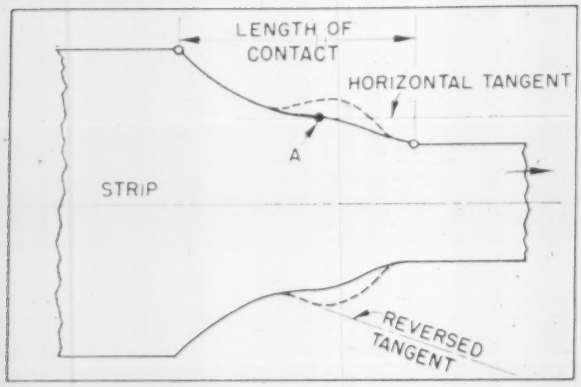

Fig. 5—Diagram representing questionable indentation of rolls by pressure of strip. (Vertical dimensions exaggerated)

seems actually to have swelled out again to a greater thickness while between the rolls. This re-expansion could be produced only by horizontal forces from adjacent parts of the strip, acting at a place where there was no vertical pressure on the strip. But in the absence of that pressure, the roll surface could not remain deformed to a concave shape. Orowan recognized to some extent the contradictoriness of these conditions, but nevertheless stated, "a genuine temporary thickening of the sheet as it passes through the neutral zone is neither impossible nor improbable." To the present author, it seems extremely improbable, and the bumpy contour in Fig. 4-a seems more probably attributable to some other cause such as, perhaps, slight inaccuracies in the roll grinding, or inhomogeneity of the brass (the latter material being known to deform irregularly in some cases.)

APPENDIX A—Equations of Korber and Eichinger and of Orowan for the No-Slip Region.

According to Korber and Eichinger[12], for a long bar or plate of width L and thickness h compressed between parallel flat platens, as in Fig. 6, the length x_o of the region on each side in which slip occurs is determined from the equation

$$f \cdot \frac{2}{\sqrt{3}} \cdot S \cdot (e^{\frac{+2f \cdot x_o}{h}} - 1) = 2S \cdot \left(\frac{L}{2h} - \frac{x_o}{h} \right) \quad (1)$$

in which f is the coefficient of friction of the strip or bar on the platens, and S is the natural flow resistance of the strip material. The factor $2\sqrt{3}$ results from the fact that flow in the direction at right angles to the plane of the paper, Fig. 6, is supposed to be suppressed. The equation may be solved by trial or by finding the intersection of the curves for the two sides.

The amount by which the maximum pressure, at the middle of the region of no slip, exceeds the pressure at the ends of that region, is

$$(p_{max.} - p_o) = 2S \cdot \left(\frac{L}{2h} - \frac{x_o}{h} \right)^2 \quad (2)$$

When applying these equations as an approximate solution for the case of rolling, where h is not constant but varies over the contact length L, in the case of strip where the no-slip region does not comprise a large fraction of the contact length, it seems reasonable to use the value of h corresponding to the peak of the v.Karman curve, for calculating from Eq. (1) the width of the no-slip region or $(L - 2x_o)$, and from Eq. (2) the maximum pressure.

The pressure at any point x in the no-slip region is

$$p = p_o + 2S \cdot \left\{ \left(\frac{x - x_o}{h} \right) \cdot \left[\frac{L}{h} - \frac{(x + x_o)}{h} \right] \right\} \quad (3)$$

This corresponds to a parabolic round-topped curve which can then be fitted into the v.Karman curve as in Fig. 2.

While Korber and Eichinger confined their attention to the case of parallel flat plates, Orowan[13] carried the matter further and attempted to apply the Prandtl plastic-flow ideas to the actual case of rolling. First he considered the case of parallel flat plates, and assumed that in the region where slipping occurs and the shearing stress is less than the product $f \cdot S$, the conditions can be approximated by considering the slipping strip as equivalent to a middle section cut out of a thicker, nonslipping strip having the Prandtl-Nadai stress distribution. If the thickness of the actual strip is h and the thickness of the thicker, nonslipping strip is h,* then using Orowan's Eq. (32),

$$h^* = \frac{S}{2f \cdot p} \cdot h \quad (4)$$

Orowan, in the paper referred to, did not carry through the complete development for parallel plates, but instead proceeded to consider the case of inclined plates forming a wedge, as being more applicable to conditions in rolling; consequently no immediate comparison with Korber's equations is possible. For the case of parallel plates, depending on how Orowan's Eq. (24) and (32) are handled mathematically, the result seems to be either

$$p = \frac{S_o}{1 - 2f \cdot \frac{x}{h}} \quad (5)$$

or else

$$p = S_o \cdot e^{\left(\frac{2f \cdot x}{h} \right)} \quad (6)$$

Eq. (5) corresponds to an excessively high friction hill and can hardly be correct. Eq. (6), on the other hand agrees exactly with Korber's Eq. (45). Eq. (3) of Stone and Greenberger[14] is also the same except that x is measured from a different reference point.

(To be continued)

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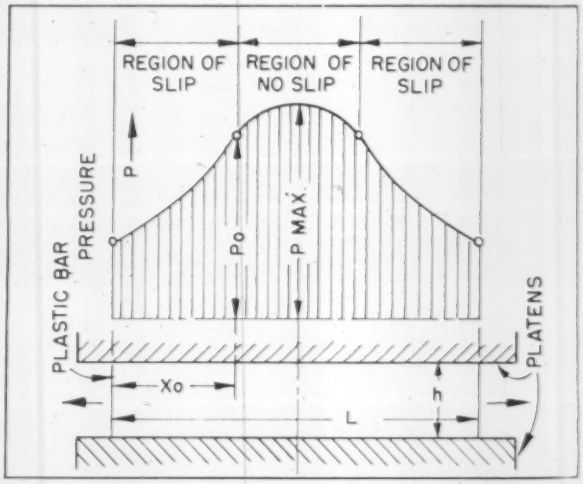

Fig. 6—Pressure distribution for a bar compressed between parallel flat plates (Korber and Eichinger)

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Extensive Western Metal Congress

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Lightweight Packs Power

A smaller, lighter railway motor capable of 90 mph sustained speed and a new system of controls to insure smoother acceleration and performance were developed by Westinghouse Electric Corp., Pittsburgh. Pennsylvania Railroad is equipping a number of its multiple-unit cars with the new motors and controls. These self-propelled cars are used for commuter service between closely adjacent stops.

Compared with previous designs the new motor costs and weighs less and at the same time provides considerable margin in its horsepower rating, Westinghouse engineers report. Fewer working parts and simpler control mean greater reliability in service and lower maintenance expense.

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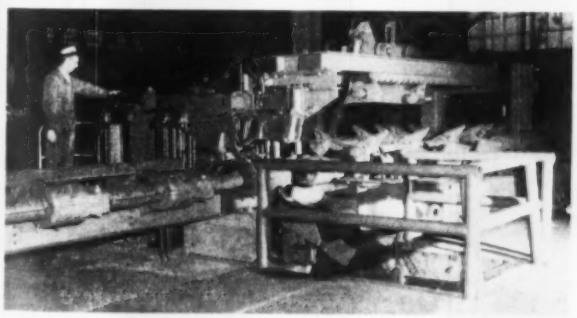
Special Bar Cutting Machine Speeds Pipe and Tube Manufacture

BAR STOCK in a tube or pipe mill must be cut to required lengths quickly and efficiently prior to the manufacturing operations. To speed up output, a special oxyacetylene cutoff machine, known as the type CM-44 bar cutting machine was designed by Linde Air Products Co., New York.

The installation illustrated is fully mechanized to handle the bars. Roll tables and clamps are not part of the machine proper. The machine is mechanized to perform the complete cutting cycle when the "start" button is pressed, and to retract the cutting head from the work when the cutting cycle is completed.

Actual cutting time for severing this 5-inch carbon steel round is 20 seconds. The control panel operates the hydraulic, air and electric motor bar-handling devices



Bars are placed by crane on a slanted table to the operator's right. They pass from the table to the rolls which feed them under the machine, shown in the center. Bar to be cut is 36 feet 8 inches long and 5 inches in diameter. Opening surrounded by the railing is a chute down which slag and short lengths can be dumped into the bucket set in the floor

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The greater rigidity of the aluminum die-cast part, supplied to KF by Doehler-Jarvis, makes fewer mounting screws necessary.

Only two screws—one at each end—are necessary in the long base of the molding, while the stamping required screws along the full perimeter.

Rigidity of the new molding makes it possible to place the top mounting screws through the unexposed upper edge of the door. The front garnish molding is mounted with four screws, the rear with five.

Other advantages of the die-cast are these:

1—The one-piece part provides a better fit. There no fitting problems resulting from variances in welds or metal finishing as encountered in the welded stamping.

2—As compared with stamping, die-casting of the new molding, due to its design, results in a slightly lower per part cost.

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4—The better fit and the fact that there are fewer screws to be mounted reduces the possibility of damage to the molding during installation.

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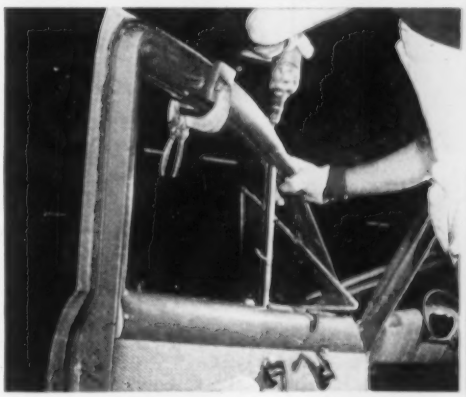

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Castings range in size from 2 ounces to 120 pounds and average about 10 pounds. Larger castings are picked off the conveyor by the operator and placed in the skip of the automatic loader of the barrel. Flat castings or fragile parts which might be damaged by tumbling go onto the table. Revolving platform of the table is set 3¼ minutes per revolution and each casting passes through the centrifugally propelled stream of abrasive twice, once for each side. Castings are cleaned to bare metal in the barrel in 5 to 7 minutes. Skid bins handled by electric fork trucks contain cleaned castings which are moved for assembly into motors and pumps made by the company.

Cadmium Preservation Set Up

Preservation and packaging policies for a long list of cadmium-plated parts and assemblies were placed in effect by the Air Force's Air Materiel Command, Dayton, O. Certain cadmium-plated parts having less than 0.0003-inch cadmium plate, exclusive of precision surfaces and close tolerances, must be treated with corrosion preventive compounds to protect them from corrosion and deterioration under adverse conditions. Included are aircraft hardware, ground equipment and handling equipment. Parts and assemblies having precision surfaces and close tolerances are exempt.

All cadmium-plated parts from which the applied preservative would be difficult to remove or be detrimental in the use of the item must

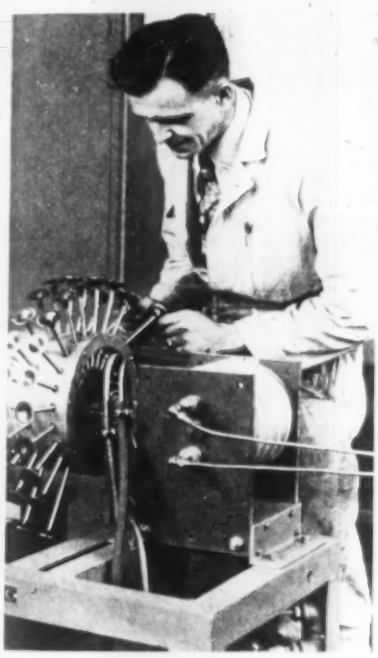
be protected by packaging in moisture-vapor proof containers in which the enclosed air is dehydrated. Electronic equipment, instruments and composite assemblies are included in this classification.

No Ducts for Air Conditioning

Introduction of Trane Co.'s Unitrane ductless air conditioning system in a New York skyscraper is being made in the 24-story office building under construction at 655 Madison Ave. Cushman & Wakefield Inc. and Douglas L. Elliman & Co. agents for the structure say the system eliminates bulky, space wasting ductwork and will give the building a piped-in air conditioning system which will supply chilled water from centrifugal compressors in the summer and warm water from the boilers during the winter months.

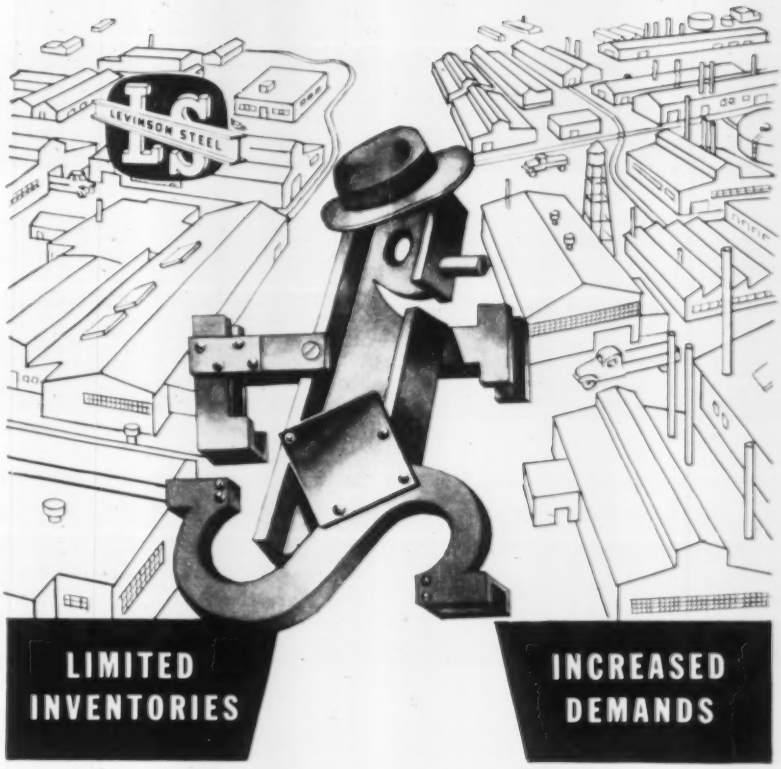
Individual room units will keep the recirculated room air properly conditioned and also handle the ventilation air, simplifying the design, instal-

Valve Gets Induction Boost



INDUCTION HARDENING boosted valve tip output to 30,000 per day at Thompson Products Co., Cleveland. The 20-kw General Electric induction heater plus a GE designed drum-type fixture replaces the former setup that used a gas torch and an automatic chain conveyor with the valve set in water, leaving only the tip exposed. Costs were trimmed 30 per cent and hardness inspections eliminated since the unit was put into operation

"It's my job to bridge the gap"



They say I'm an all-department guy. Sometimes I'm the boss and other times I'm just a flunky. My main job, though, is to help you get the metals you need in these tough shortage days.

I may be scouting for a bar of 2" cold finish for a breakdown job, or trying to figure out how a 6" channel can do where an 8" channel was called for; or perhaps studying your design to see if your requirements can be met with less metals.

Sometimes I feel like beefing about limited inventories and increased demands . . . but it takes all of my ingenuity, imagination and time, and plenty of old fashioned plugging to bridge the gap between our supply and your needs.

"Shorty"

P.S. Remember, I always charge fair prices, no matter what the market or the supply. That's company policy.

Levinson

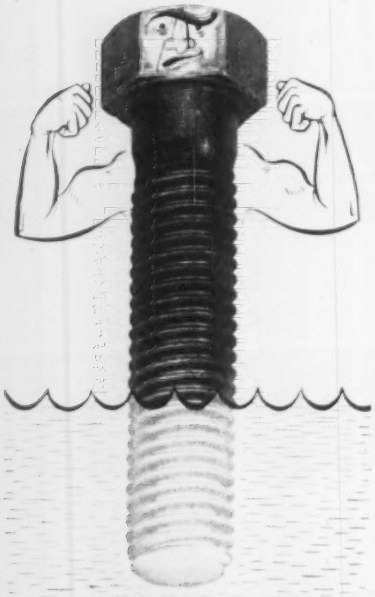
STEEL SALES CO.

Warehouse Aluminum & Steel Products

LSS-41

20TH AND WHARTON STS. S. S., PITTSBURGH, PA.

TOUGH Cleaning Jobs Turn "SISSY"



Easy to Handle with

HOUGHTON'S HOUGHTO-CLEAN 220

Emulsion Type Cleaner*

HOUGHTO-CLEAN 220 forms a stable non-foaming emulsion with water—hot or cold. It removes processing oils, dirt and coatings from metals without harming the surface. It is equally effective in spray, dip and power washing . . . for either ferrous or non-ferrous metals. And because it can be diluted as much as 1 to 50 parts for power washing you'll find HOUGHTO-CLEAN 220 most economical to use. Write E. F. Houghton & Co., Philadelphia 33, Pa.

* This emulsion type cleaner can be used in many places instead of alkaline cleaning. Also, many users have found HOUGHTO-CLEAN 220 a superior replacement for either straight petroleum solvents or non-flammable solvents.

WRITE FOR DATA SHEET

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

lation and operation problems of the system. Each room unit will be a true air conditioner and will permit individual temperature and humidity regulation through a four-position control, including an off position. The system eliminates the need for large equipment rooms to pump conditioned air to its destination and the use of large machinery for cleaning, purifying and removing moisture from ventilation air.

Welding Safety Promoted

Issuance of an American Standard "Safety in Electric and Gas Welding and Cutting Operations" is believed especially timely by the American Welding Society with production on the increase and use of untrained personnel becoming a bigger factor in maintaining high output. The present standard was prepared by a committee sponsored by the American Welding Society and reflects the best recommendation of welding engineers, safety engineers, equipment manufacturers, insurance organizations and governmental labor agencies.

Covered in American Standard Z49.1 are regulations for the safe installation and operation of welding equipment for arc, gas and resistance welding processes. Provisions are included for fire prevention and protection in regularly assigned welding areas and other locations. Protection of personnel covers both the welder and other workers in adjacent areas. Precautions are specified for welding of materials which may give off toxic fumes and for welding in confined spaces. Ventilation requirements have been considerably modified from the American War Standard and are more clearly prescribed to be more useful to industry. Copies are available for 50 cents from the American Welding Society, 33 W. 39 St., New York 18.

Ajax Awarded B & W Furnace

Salt bath furnace for heating billets to be used in the Ugine-Sejournet process is being designed and built by Ajax Electric Co. Inc., Philadelphia, for Babcock & Wilcox Tube Co. The billets will be heated to 2250° F and made into seamless steel tubing in the first application of the French hot extrusion process in the United States.

Furnace will have a connected load of 900 kw and the bath will be heated internally by totally submerged electrodes. Hourly capacity is 10,000 pounds. The furnace will have the form of an annular ring and be

PROFIT BY THE PRODUCTION ADVANTAGES AND INCREASED PHYSICAL PROPERTIES OF FURNACE TREATED COLD FINISHED STEEL

ANNEALED • HEAT-TREATED STRAIN RELIEVED

SPECIFY **WYCKOFF**

COLD FINISHED STEEL
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-to your exact requirements

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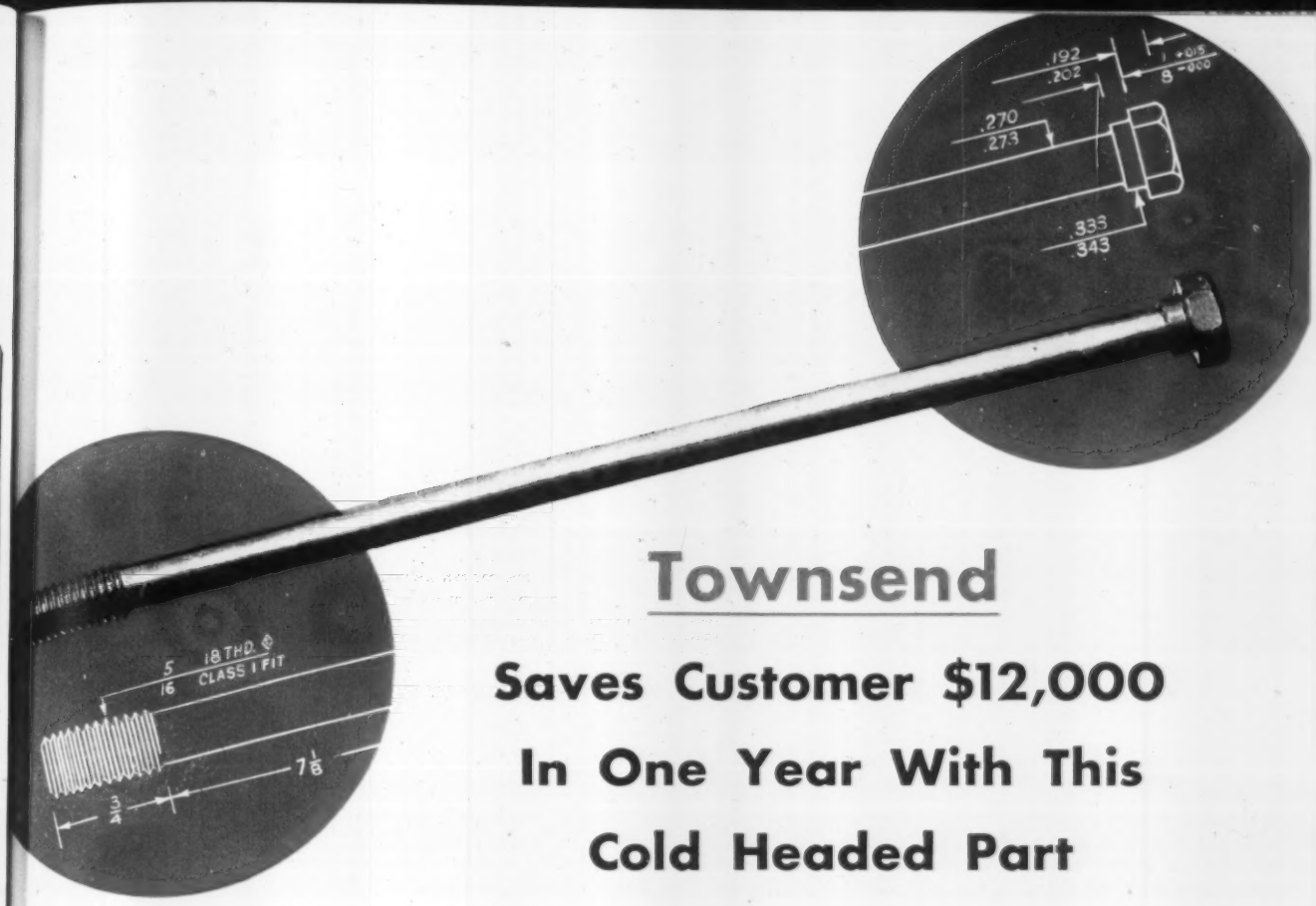


Townsend

Saves Customer $12,000 In One Year With This Cold Headed Part

There may be several parts you are now using that Townsend can produce for you by cold-heading at substantial savings just as we did for a mid-west washing machine manufacturer. Originally the wringer spring rod shown above was made on a bolt maker at $33.40 per thousand. Then a Townsend engineer suggested that this same item, with virtually no change in design could be made by upsetting the head and shoulder at a cost of only $20.95 per thousand — a clear savings of $12.45 per thousand. On an annual basis they save more than $12,000 on this part alone.

Savings like this are not unusual with Townsend customers — this is a typical example — some manufacturers save even more. Such economy is a reflection of the size and experience of the Townsend organization and demonstrates the possibilities for savings even on simple items.

Townsend makes 60 million items every working day by cold-heading and extruding — then they may be pointed, machined, drilled, slotted, trimmed, threaded, pierced, knurled, bent, or flattened. We make parts of carbon and stainless steels — in bronze, copper, aluminum — in a variety of platings and finishes. If you want to learn more about the economy of cold-heading by Townsend ask to have one of our engineers call.

Townsend

COMPANY • ESTABLISHED 1816

Plants—New Brighton, Pa. • Chicago 38, Ill.

Division Sales Offices—Philadelphia, Detroit, Chicago

Sales Offices in Principal Cities

WELDING SPECIALISTS

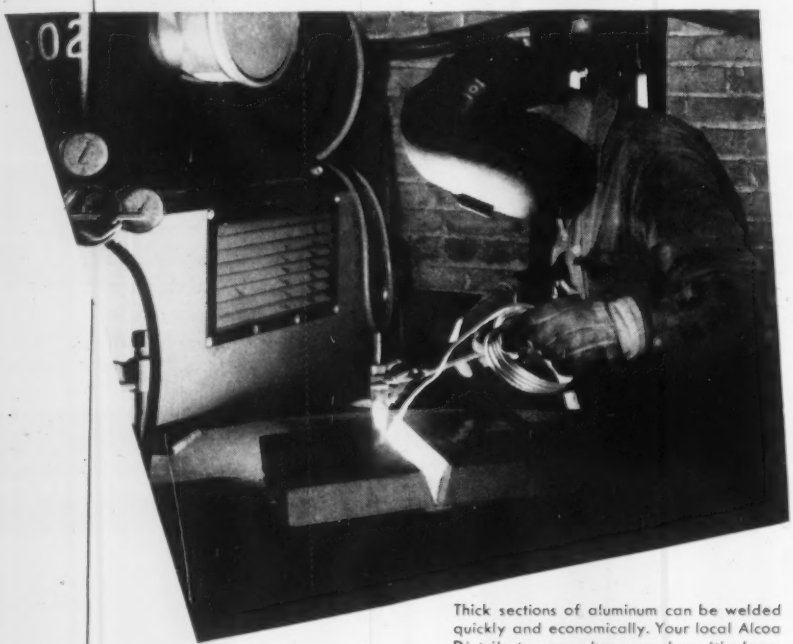
helping America rearm with Aluminum should have the technical help of their

LOCAL ALCOA DISTRIBUTORS

How do you make good joints in aluminum? Simply add a few techniques to your present skill. Have an expert do some welding and brazing in your own shop. Talk over your jobs with him. Hundreds have learned this way through their Alcoa Distributors.

Your Alcoa Distributor offers booklets and movies to help train your employees. A staff of aluminum welding experts who'll gladly work with your shop men. A stock of the world's best aluminum welding and brazing supplies.

Look for your local Alcoa Distributor listed under "aluminum" in your classified phone book. Or write ALUMINUM COMPANY OF AMERICA, 1942B Gulf Building, Pittsburgh 19, Pennsylvania.



Thick sections of aluminum can be welded quickly and economically. Your local Alcoa Distributor can show you how it's done.

ALCOA FIRST IN ALUMINUM ®

equipped with a mechanism to automatically charge and unload the billets as well as convey them on a predetermined time cycle through the bath.

The hot extrusion process employs glass as a die lubricant. In addition the inventors have found that billets must be heated rapidly and then soaked at temperature for a short time. No scale is permissible. These requirements dictated the selection of the salt bath furnace.

Teletypewriter Systems Gain

Private fully automatic teletypewriter systems similar to the one used by Republic Steel during World War II have been installed in five nation-wide concerns, W. M. Bacon and G. A. Locke of Bell Telephone Laboratories told the American Institute of Electrical Engineers at the annual winter meeting in New York. The system provides efficient, accurate and rapid handling of a continuous flow of messages between the various stations on the network, AIEE members were told. No handling or operating attention is required other than the original perforation and removal of the message from the receiving station or stations.

Active development is being continued to provide new and improved features for this type of system, based on engineering studies of the needs of potential users as well as experience gained with the six large systems now in use. Increased speed of message delivery, greater line capacity, simpler operating procedures and simplified circuit arrangements to reduce maintenance are among items covered in the present development program.

Bright Finishes Still Possible

Bright finishes for plated materials can be attained even though manufacturers must change plating specifications from critical chromium, nickel and copper, says R. O. Hull & Co., Rocky River, O. Conversion from normal cadmium and zinc baths to Rohco 20XL, 100 and 103 brighteners does not entail extra treatment or delay in production.

Available as a liquid or powder, 20XL cadmium brightener gives deposits that are brilliant, uniform and have excellent covering power. Barrel solutions may be operated up to 105° F resulting in maximum production. Wide latitude of operable concentration range provides ease of control. For zinc plating Rohco 100 is used with barrel plating and 303 is a still brightener. Both have high

covering power so that recesses that are often unplated are easily covered with a substantial thickness of deposit.

Longer Life for Galvanizing Aids

Useful service life of pickling tanks, boats and yokes for galvanizing fabricated metal products at Lehigh Structural Steel Co., Allentown, Pa., got an upward boost when the company began using Carpenter stainless steel No. 20. Prior to using the relatively new material, replacement of this equipment was a costly problem.

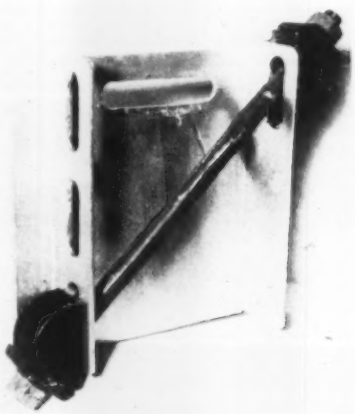
Galvanizing boats and yokes made from the stainless steel are still in excellent condition after considerable use. The material's excellent corrosion resistance is also being successfully used in the drainage systems of Lehigh's pickling tanks.

Publish Drawing Abbreviations

American Standards Association, New York, has published a revised edition of abbreviations for use on drawings. To bring the 1946 edition up to date with latest industry-wide practice, a committee representing technical associations, industry, government and independent experts worked on its development.

Special new sections on abbreviations for colors, valves and screw

Washer Adjusts to Varied Jobs



AUTOMATIC adjustment to any angle that rod bracing enters beams, columns or gusset plates is provided with the beveled washer made by Ohio Structural Steel Co., Newton Falls, O. While automatically adjusting to any angle the O.S.S. washer still gives a constant dimension from face of member. Only provision for its use is a slotted hole in the structural member. In erection, the dog on the washer fits into a slotted hole, preventing slipping

fishin' is fun . . . with care on the run

Here's a fellow that enjoys complete relaxation. He knows his plant is safeguarded from fire . . . a short circuit, a stray spark, a forgotten cigarette or spontaneous combustion can't cut into production time, destroy valuable records or endanger the lives of employees.

You too, can have this same peace of mind about fire by fully protecting your investment in materials, equipment and buildings with modern, approved C-O-TWO Fire Protection Equipment.

No matter what your property . . . factory, mill, warehouse, power station or research center . . . or a particular fire hazard such as spray booth, dip tank, pump room, electrical equipment enclosure or record vault . . . there is a type of C-O-TWO Fire Protection Equipment that gives you fast, positive action the instant fire strikes. Whether it's a C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguisher for an incipient fire, or a C-O-TWO Built-In High Pressure or Low Pressure Carbon Dioxide Type Fire Extinguishing System for total flooding an entire fire hazardous area . . . C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

For example, at many locations a C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a "must". The first trace of smoke in a protected area sounds an alarm . . . then fast, clean, non-damaging, non-conducting carbon dioxide blankets the fire, putting it out in seconds, before it spreads and causes extensive damage.

So, let an expert C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today for complete free information . . . our experience is at your disposal.

C-O-TWO

C-O-TWO FIRE EQUIPMENT COMPANY

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Sales and Service in the Principal Cities of United States and Canada

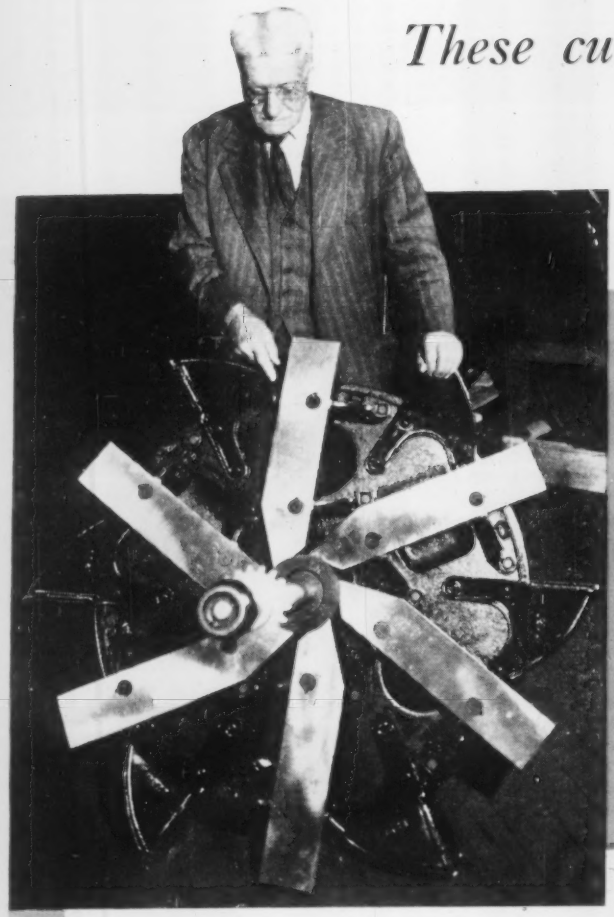
Affiliated with Pyrene Manufacturing Company

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

Now made of U·S·S

These cutter blades are tougher,



W. H. Preston, President of Papec Machine Company, examines the sharp edge on one of the six blades mounted on the cutting wheel of a Papec machine.

Because of the uniformity of CARILLOY 4150 blades, grinding of the beveled edges can be done with a multiple set-up on this Hanchett grinder.

Stones, wood, roots and even bits of metal pass through the spinning blades of Papec forage harvesters. Now made from heat-treated CARILLOY 4150, these blades are tougher than ever — and easier and cheaper to fabricate.

Carilloy Steel...

harder—yet easier to fabricate

and cost 25% less!

SOMETIMES it costs less to use steel that costs more. Here's a case history to prove it.

Ensilage cutters and forage harvesters made by Papec Machine Company have long been regarded as tops in agricultural circles. The working heart of these machines are the cutter blades—and they really take a beating. When handling crops from stony fields, appalling amounts of stone along with wood, roots and bits of metal pass through the blades. To withstand abuse like this the blades *have* to be very tough indeed.

Papec formerly used a "laid-on" blade—a low carbon steel body with a high carbon cutting edge rolled on under high pressure and heat. These blades were good—but Papec wanted to make them better. So they called in our service metallurgist. Working closely with their engineers he finally found a way to greatly increase cutter blade durability. Now these vital parts are made of extra-tough, extra-hard *alloy* steel —heat-treated U·S·S CARILLOY 4150.

Simplified fabrication with U·S·S Carilloy 4150 cuts cost 25%

CARILLOY 4150 is plenty tough inside. Therefore it can safely take shocks that would ruin a more brittle blade. But it's also extremely hard on the surface—to furnish a sharp cutting edge that *stays* sharp. In other words, U·S·S CARILLOY 4150 provides the ideal combination of toughness and hardness that prevents damaged blades and time-wasting shutdowns.

In this application, CARILLOY 4150 does more than make a better blade—it speeds up fabrication, too. Testing it against air-hardening tool steel, Papec engineers found that, after heat-treating, CARILLOY 4150 showed all-round better characteristics and held a keen edge longer. The steel was also much more *uniform*. This uniformity paid off in two ways: First, the heat-treated CARILLOY blades were *easier* to machine. Second, the blades were less distorted after heat treatment, so *less* machining was required. As a result, the CARILLOY blades not only were much cheaper than air-hardened tool steel, but actually cost 25% less than the old "laid-on" blades.

Whatever properties your product needs—strength, toughness, light-weight, or superior durability under trying conditions—service-tested U·S·S CARILLOY Steels can provide them. And quite often at lower cost.

United States Steel Company
Room 4247, Carnegie Building
Pittsburgh 30, Pa.

☐ Please send me your book on U·S·S Carilloy Steels.

Name.....

Company.....

Address.....

City and State.....

UNITED STATES STEEL COMPANY, PITTSBURGH • COLUMBIA STEEL COMPANY, SAN FRANCISCO
NATIONAL TUBE COMPANY, PITTSBURGH TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
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USS TRADE MARK

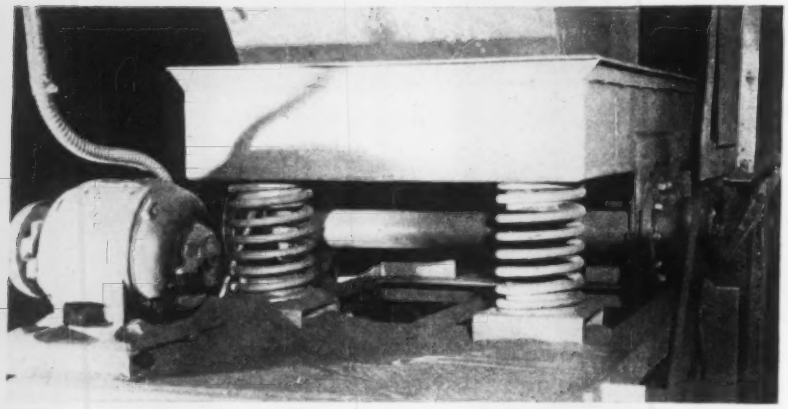
Carilloy Steels

ELECTRIC FURNACE OR OPEN HEARTH • COMPLETE PRODUCTION FACILITIES IN CHICAGO AND PITTSBURGH

1-150

UNITED STATES STEEL

THE FIRST SIMPLE, PRACTICAL LOW-COST *FULLY MECHANICAL* VIBRATING FEEDER



The Hewitt-Robins Vibra-Feeder® performs as well or better than the most expensive mechanical feeders. Its only electrical is a light-duty plug and receptacle; current draw is as little as 2 *amperes!*

The Vibra-Feeder saves you money in initial cost, and thereafter. Here's how:

No extras. First cost covers *everything* for complete installation, including motor, V-belts, sheaves, cable, all other accessories.

Easy to install. Simply bolt the Vibra-Feeder to any available base—or suspend it where desired. Hook the motor to the line, and it goes to work.

Easy to operate. Just push a button, then start loading. The Vibra-Feeder is fully *mechanical* . . . can't be overloaded . . . won't bog down . . . feeds consistently under any load! Once set for your load, you can forget it.

Low-cost replacement parts. The only moving parts are in the vibrator itself. They're simple in form, low in cost, easily serviced by your own men. No costly control boxes, tubes, motor generators, etc. to repair or replace.

Negligible maintenance. Only two points to lubricate, both on the vibrating mechanism. Little servicing required—your own men can do it.

Fully mechanical vibrator. Simply constructed . . . only four bearings and an eccentric shaft. Completely dust-tight, impervious to heat and cold, practically noiseless.

Wide range of sizes. From 24" to 48" wide and 48" to 96" long. Other sizes to meet your precise specifications.

The Vibra-Feeder is another economical Hewitt-Robins materials handling machine . . . another Hewitt-Robins "first" that saves time, trouble and money, no matter what you have to move. For complete details, write for Bulletin 134, Robins Conveyors Division, Passaic, N. J.

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

HEWITT-ROBINS
VIBRA-FEEDER

HEWITT-ROBINS HR **INCORPORATED**

BELT CONVEYORS *(belting and machinery)* • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS
DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS
INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

threads are included in the 1950 edition. Section on abbreviations and letter symbols for cable and magnet wire is enlarged to include colors of cable and magnet wire. Over 200 changes were made in the abbreviations included in the original edition and more than 40 new abbreviations are added. Copies are available from the association at 70 E. 45 St., New York 17, for $1 per copy.

Bending Made Easy

Information on how to bend tubing, extrusions, moldings, channels and solid bars is contained in a 32-page booklet titled "It's Easy To Bend" and published by O'Neil-Irwin Mfg. Co., Lake City, Minn. Although the many illustrations in the booklet show Di-Acro benders made by the company, the ideas actually apply to any rotary bending machine.

Sections show the various types of bends commonly used such as centered eye, off-center eye, circle, zero radius, square, spring or coil and loop and spiral. The problem of bending is also attacked by the various metal forms used. Illustrations and specifications of the company's bending machines, rod parters and accessories are included in the booklet.

Hoist Servicing Easier

A swing-out transformer panel which facilitates servicing and adjustment of Bob-Cat electric cable hoists is announced by Cleveland Chain & Mfg. Co., Cleveland. The supply line transformer which reduces voltage at the pushbutton control to 110 volts is mounted on the panel. By swinging this transformer and its contacters out of the way, the motor brake is made readily accessible for routine adjustments.

It eliminates the necessity for removing attachment bolts or disconnecting electrical leads, two service operations commonly required in hoists. The panel is held securely in place by a quick release slotted head screw. It is standard equipment on all Bob-Cat models from ½ to 5-ton capacities having pushbutton controls.

Washing May Do the Trick

Plant interiors may be washed at savings in manpower and materials if the paint is good but covered with smoke and dust, says Continental Car-Na-Var Corp., Brazil, Ind. The company has a wall washing machine that enables one man to clean from 2500 to 3200 square feet of wall in an eight-hour shift. The

unit weighs 28 pounds and requires no electrical connections. The machines are not recommended for sand finish or very rough walls.

Lukens Trims Hot-Tops

Important savings are made every heat by Lukens Steel Co., Coatesville, Pa., through the use of a newly developed hot-topping compound. The compound, called Mexatop, was developed by the United States Graphite Co., Saginaw, Mich., in conjunction with Lukens' open-hearth and research departments.

Mexatop enables Lukens to cut the poured height of hot-tops by 2 inches and reduce the metal in the hot-top by 1.5 per cent on maximum weight ingots, saving 3000 to 4000 pounds per heat. Use of the compound also gives a desirable U-shaped cavity in the hot-top instead of the objectionable V. The compound weighs 48 pounds per cubic foot and can be applied for 3 cents per ingot ton. It is equally effective on casting risers.

Compressor Motors Detailed

Information on motor drives for all types of large air compressors is supplied in issue No. 32 of the E-M Synchronizer, published by Electric Machinery Mfg. Co., Minneapolis. G. L. Oscarson, chief application engineer, gives information and selection data on both motors and controls for a variety of compressor types and sizes.

Tables, charts and graphs assist the user in matching motor characteristics to compressor requirements. Other features are technical discussions of "synchronizing power" and various methods of motor and control protection for compressor installations.

Armco Reproduces "Ads"

For the last five years Armco Steel Corp., Middletown, O., has been using the back page of its employee publication "The Arm-Co-Operator" to carry to its employees the story of free enterprise in action. This message has been in terms of the employees' jobs and has taken the form of newspaper or magazine advertisements.

The series of so-called "ads" created considerable demand from other industries for copies. In answer to this demand Armco is making available a booklet titled "Raindrops of Understanding" that contains 22 of the more than 50 "ads" that have run to date.

THE BROWN COMPANY, Quality Paper Makers of Berlin, New Hampshire, says: "In seven months—

This Lubricant saved us $2,098.16"

"During the seven month period before using LUBRIPLATE No. 130AA in the bearings of our Kraft Mill Lime Kiln, we used a conventional oil of the density recommended. The cost of the lubricant for the period was $2,134.00. In the seven months that followed, we only used 128 lbs. of LUBRIPLATE No. 130AA for initial filling and replacement at the cost of $35.84. LUBRIPLATE No. 130AA only requires weekly applications whereas the former lubricant required daily application."

• • •

The Brown Company is a progressive organization that is continuously seeking ways to improve their products, their methods and to cut costs. Naturally, when they found LUBRIPLATE No. 130AA, a grease type lubricant with great adhesive qualities, high film strength, and with high heat resistance, they saw the possibility of using it to their advantage in the bearings of their kilns and other equipment.

LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. They reduce friction, wear and power consumption, they prevent rust and corrosion, they last much longer than ordinary lubricants. There is a LUBRIPLATE Lubricant that is best for every lubrication requirement. Let us send you information about the use of LUBRIPLATE Lubricants in your industry. *Write today.*

LUBRIPLATE DIVISION—Fiske Brothers Refining Company, Newark 5, N. J., Toledo 5, Ohio.

DEALERS EVERYWHERE—CONSULT YOUR CLASSIFIED TELEPHONE BOOK

LUBRIPLATE **THE MODERN LUBRICANT**

Heavy-Duty

GEARS

Cutting the teeth in a large diameter spur gear in the Simonds shop.

LARGE GEARS

OF ALL TYPES

up to 12 ft. dia.

When you need large or heavy-duty gears for new industrial equipment—for special machinery—for repairs or replacements—call on SIMONDS GEAR where they have been a specialty for more than 50 years. SIMONDS GEAR assures you of personalized attention to your specific requirements—faithful reproduction of your most exacting specifications—and faster service because SIMONDS' production is geared to specialized work. For all types of heavy-duty gears ranging to 145" dia. in materials including cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite—send your inquiry to SIMONDS GEAR.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA

CALENDAR OF MEETINGS

†Denotes first listing in this column.

Feb. 19-22, American Institute of Mining and Metallurgical Engineers: Annual meeting, Jefferson Hotel, St. Louis. Institute address: 29 W. 39th St., New York.

Feb. 26-29, American Medical Association: Congress on industrial health, Biltmore Hotel, Atlanta. Association address: 535 N. Dearborn St., Chicago 10.

Mar. 5-7, Hydraulic Institute: Quarterly meeting, Santa Barbara Biltmore Hotel, Santa Barbara, Calif. Institute address: 122 E. 42nd St., New York.

Mar. 5-9, American Society for Testing Materials: Spring meeting, Cincinnati. Society address: 1916 Race St., Philadelphia.

Mar. 6-8, Society of Automotive Engineers: Passenger car, body and materials meetings, Hotel Book Cadillac, Detroit. Society address: 29 W. 39th St., New York.

†**Mar. 7, Bituminous Coal Research Inc.:** Annual meeting, Deshler-Wallick Hotel, Columbus, O. BCR address: 2609 First National Bank Bldg., Pittsburgh 22. (meeting postponed from Feb. 7)

†**Mar. 12-14, American Society of Training Directors:** Annual conference, Bellevue Stratford Hotel, Philadelphia. Convention address: Allegheny & 19th Sts., Philadelphia 32.

†**Mar. 12-14, American Roadbuilders Association:** Annual meeting and national defense conference, Hotel Schroeder, Milwaukee. Association address: 1319 F St., Washington 4.

Mar. 12-15, National Electrical Manufacturers Association: Meeting, Edgewater Beach Hotel, Chicago. Association address: 155 E. 44th St., New York 17.

Mar. 13-16, National Association of Corrosion Engineers: Conference and exhibition, Statler Hotel, New York. Conference committee address: P. O. Box 6120, Philadelphia 15.

Mar. 15-17, American Society of Tool Engineers: Annual meeting, Hotel New Yorker, New York. Society address: 10700 Puritan Ave., Detroit 21.

Mar. 18-23, Pressed Metal Institute: Spring meeting and technical session, Hotel Carter, Cleveland. Institute address: 13210 Shaker Square, Cleveland 20.

†**Mar. 19-20, Liquefied Petroleum Gas Association Inc.:** Convention and trade show; directors' meeting, Biltmore Hotel, Atlanta. Association address: 11 S. La Salle St., Chicago 3.

Mar. 19-21, National Association of Waste Material Dealers: Annual meeting, Stevens Hotel, Chicago. Association address: 1109 Times Bldg., New York.

Mar. 19-21, Steel Founders' Society of America: Annual meeting, Edgewater Beach Hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15.

Mar. 19-23, American Society for Metals: Seventh western metal exposition and congress, auditorium and exposition hall, Oakland, Calif. Exposition address: 215 S. Clark Dr., Beverly Hills, Calif.

Mar. 21-22, American Hot Dip Galvanizers Association Inc.: Annual meeting, Hotel Biltmore, Atlanta. Association address: 2311 First National Bank Bldg., Pittsburgh 22.

Apr. 2-3, Diamond Core Drill Mfrs. Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 122 E. 42nd St., New York.

Apr. 2-4, American Institute of Mining and Metallurgical Engineers: Open hearth and blast furnace, coke oven and raw materials conference, Statler Hotel, Cleveland. Institute address: 29 W. 39th St., New York.

PAGE WIRE

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
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ROUND
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You draw the Shape
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—the way you want it for your production—whether it's ALL of your product, or only a part.

Cross-sectional areas up to .250" square; widths to ⅜"; width-to-thickness ratio not exceeding 6 to 1.

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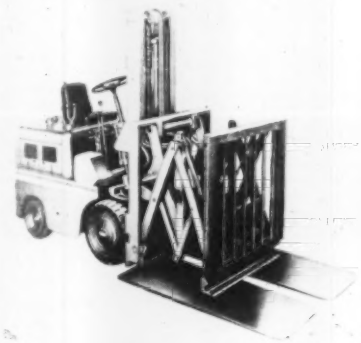
PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

New Products and Equipment

Pallets Not Needed

A fork-truck device for handling unit loads without use of conventional pallets and known as the Pul-Pac, is in production at Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Principal change from the earlier design is the adoption of



a pantograph-type linkage to actuate the gripper-jaw and pusher rack, in place of the long piston rods employed on previous models.

Redesign allows a shorter hydraulic stroke from a more powerful piston and eliminates the severe bending stresses to which the long pistons were subjected. Strong side forces formerly exerted on the long pistons are now absorbed by the pantograph which is ruggedly built to withstand them. The new construction eliminates all Pul-Pac structure back of the uprights which contributes to maximum visibility and safety for the driver. The unit has a detachable mounting and is interchangeable with standard forks up to 54-inch usable length.

Check No. 1 on Reply Card for more Details

Temperatures On Demand

Addition to the line of testing equipment built by Electro Mechanical Devices Division, George L. Nankervis Co., 19255 W. Davison, Detroit 23, Mich., is the hot-cold test stand. Unit produces temperatures between −70° F and +230° F.

Designed for testing small aircraft parts, the test stand has a deep well which can accommodate parts measuring 6 x 6 x 8 inches. Part to be tested is placed in the deep well and the thermal selector set at the desired temperature. Part under test assumes the temperature of the deep well and can then be withdrawn and checked for operation. To accommodate testing of small parts which are mounted on larger assemblies and cannot be placed in the deep well, thermal fluid can be circulated in a closed system a short distance from the test stand in insulated lines.

The hot-cold test stand measures 30 x 40 x 54 inches. It is self-contained and requires only power and water supply. Electricity and cooling water are conducted in flexible conductors to maintain mobility. Safety and automatic devices include totally enclosed motors, automatic release valves, explosion proof electrical components, etc.

Check No. 2 on Reply Card for more Details

Die Casts Automatically

A. B. C. Die Casting Machine Co., 339 W. 112th Pl., Chicago 28, Ill., announces an air-operated zinc die casting machine with completely automatic cycling and adjustable timing dwell on the opening and closing of the toggle and injection of the molten metal. Castings up to 1 pound

in capacity utilizing die blocks from 1½-inches thickness by 8 x 10 inches with an allowable increase in die thickness up to 3 inches for each half can be produced.

Machine is equipped with a 200-pound pot and is capable of a free cycling speed beyond 1000 shots per hour. Rugged construction and powerful toggle arrangement insure relatively flash free castings.

Check No. 3 on Reply Card for more Details

Safe Acid Handler

A pneumatic bulb type acid pump for safe, efficient handling of acids and other liquids is obtainable from the Hanson-Van Winkle-Munning Co., Matawan, N. J. Primary feature of the plating room aid is the reduction of fumes.

Pump fills bottles with small neck openings without the use of a funnel. Stream of acid is smooth and absolutely free from spurts from start to finish. Faster action is possible than with a siphon and no dangerous air pressure is generated inside the carboy. Overflow pipes have no connection with the valve body and when pump is withdrawn, no acid remains in it.

Check No. 4 on Reply Card for more Details

Flexible Shaft Tool

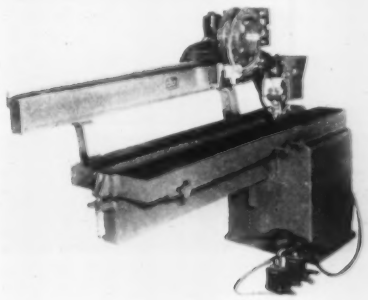
Barton Products Inc., Defiance, O., announce a flexible shaft tool using a ¼-hp, 110 volt ac motor. The work rotates at 6000 rpm using a 4-foot flexible shaft. Either a ¼-inch or ⅛-inch collet is applied. Motor may be hung at work site by means of a bail.

Check No. 5 on Reply Card for more Details

Many Welding Applications

A wide range of applications without tying capital investment to one particular welding job is possible with a welding machine made by the Cecil C. Peck Co., Cleveland, O. Machine being manufactured is a standard seam welder for automatically welding seams in metal ranging from 14 gage to ¼-inch. This universal horn type welding machine uses a Lincolnweld head and carriage for automatic hidden arc welding.

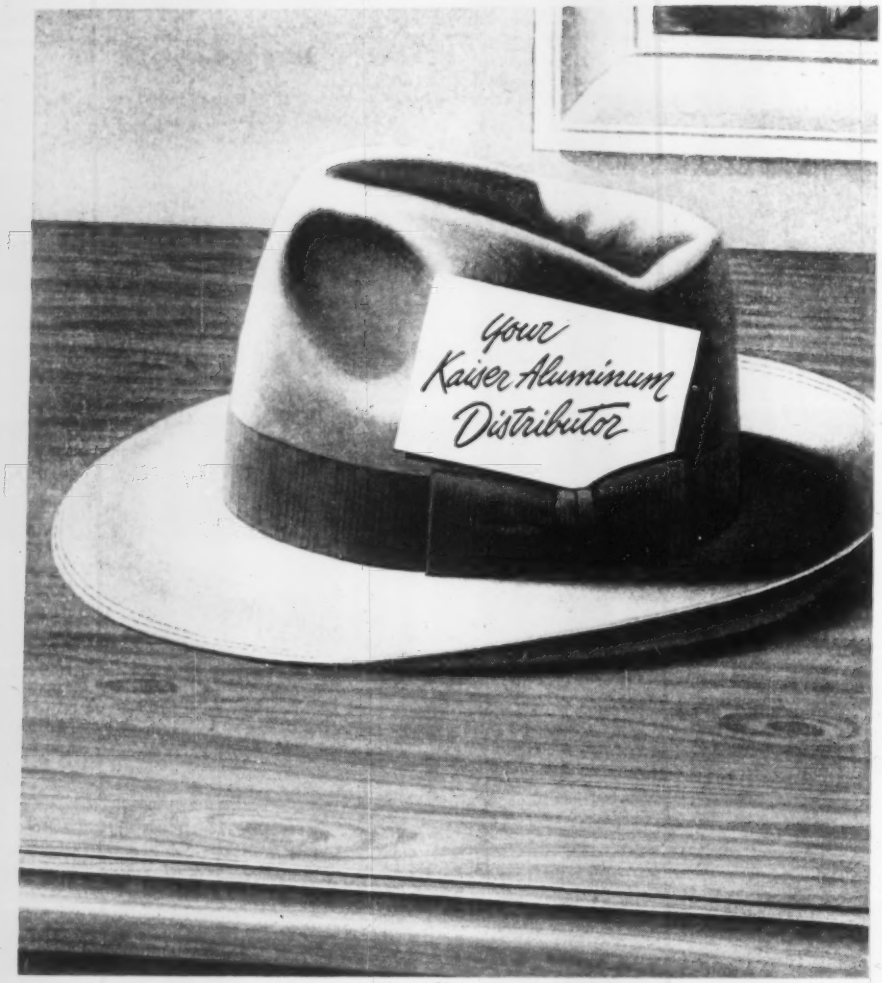
Machine is designed for welding cylinders or hollow shapes. It can be used to splice sheets and through-weld flanges in making containers. Work up to 18 feet long can be han-



dled and the machine can be extended to take longer pieces. Minimum diameter is 12 inches.

Work is placed over the rigid box section horn and the two edges of the seam to be welded are gripped by pneumatically operated heavy copper fingers. Clamping pressure of the fingers is provided by air tubes in a hollow box section weldment on top of the horn.

An air-operated copper anvil clamps tightly up against the back



Name to paste in your hat!

WITH ALUMINUM in critical demand, your Kaiser Aluminum Distributor is even *more* important to know and to keep in touch with.

As one of the nation's leading materials suppliers... backed by the fully integrated resources of Kaiser Aluminum . . . he can often advise you of future availabilities.

And he can continue to render specialized mechanical and advisory services.

NOTE: To help meet critical military needs, Kaiser Aluminum has begun a vast expansion program which will greatly increase production of primary aluminum.

When conditions permit, this aluminum will be shared by manufacturers of civilian goods.

Meanwhile, keep in touch with your Kaiser Aluminum Distributor. He's eager to help you all he can.

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Eagle Metals Company
E. 320 Trent Ave., Madison 2419

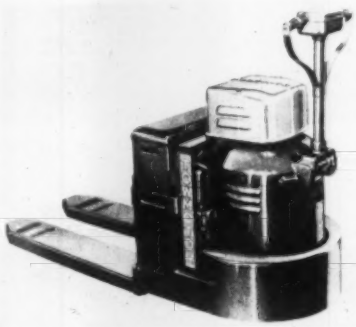
WICHITA, Kansas
General Metals Mfg. Co., Inc.
218-220 S. Wichita, Phone 7-1208, 7-1209

of the seams being welded. Fingers and back-up anvil clamp the work in exact alignment with a minimum of deflection and variation in area throughout the joint.

Check No. 6 on Reply Card for more Details

Pallet Truck Improved

Features of the improved model W electric pallet truck made by Towmotor Corp., Cleveland 10, O., are a new contactor panel, a positive action brake, improved differential action, and tall rubber, dual trailer wheels



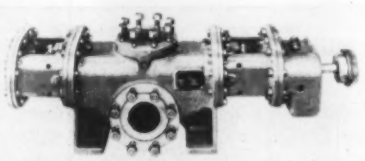
for smoother operation. It will handle pallet loads up to 4000 pounds. Operator controls are located for finger-tip operation for either the right or left hand. Power to the dual control buttons provides positive turn off with a key switch.

Other features include smooth hydraulic lift, rapid raising of heavy loads, powerful electric drive, and agile maneuverability.

Check No. 7 on Reply Card for more Details

Wide Pumping Range

An external gear and bearing bracket type screw pump with positive displacement of nonlubricating liquids of all viscosities at 1 to 700 gallons per minute, is announced by Sier-Bath Gear & Pump Co. Inc., 9252 Hudson Blvd., North Bergen,



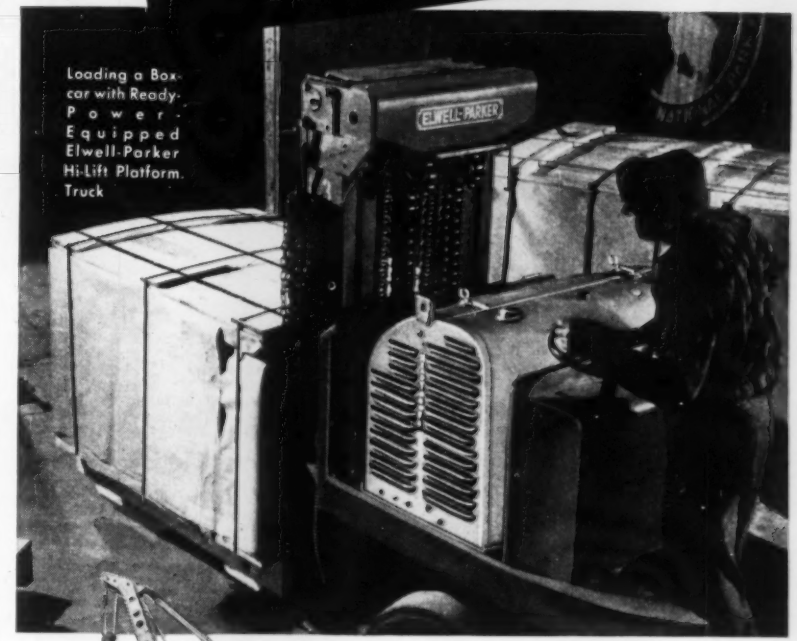
N. J. External timing gears and all bearings are in housings which form an integral unit with the pump body. This eliminates the strain on bearings or misalignment of shafts or rotors due to change of respective positions of pump body and separate housings.

Rotors are positioned axially as well

for CONTINUOUS ELECTRIC POWER

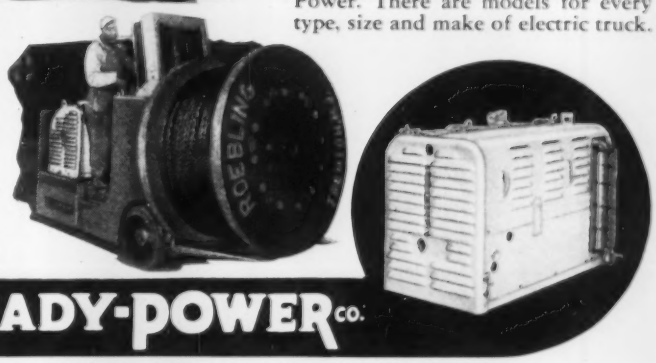
Diesel-Electric Locomotives

READY-POWER-equipped ELECTRIC-TRUCKS



Loading a Box-car with Ready-Power-Equipped Elwell-Parker Hi-Lift Platform Truck

Yale Crane Truck Equipped with Ready Power



Ready-Power-Equipped Automatic Fork Truck

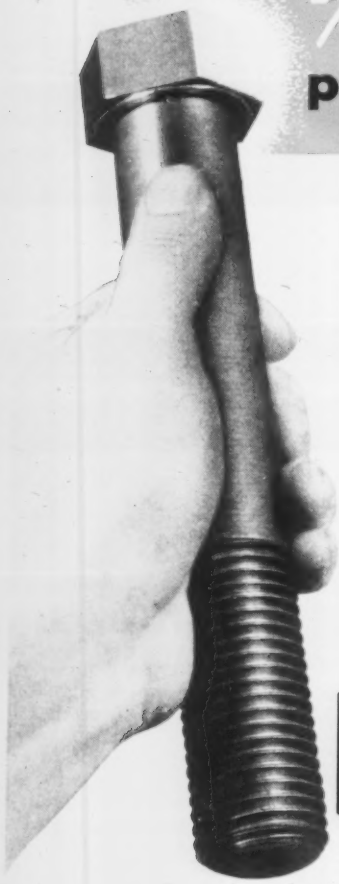
Modern Diesel-electric locomotives and Ready-Power-equipped electric trucks operate alike. Both generate dependable electric power right on the vehicle; both operate economically; and both excel where long, continuous operation pays off. Your electric trucks will do more work at less cost when equipped with Ready-Power. There are models for every type, size and make of electric truck.

THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

Unusually Large Cap Screws—

(usually hard to find) are regular CLEVELAND *Top Quality* production



For many years Cleveland has catalogued "larger than usually listed" sizes of hex head Cap Screws—stocks a fair assortment whenever possible—makes for you whatever you need up to 2½" diameter, lengths to 36". Also Set Screws to 1½" x 10". Clean, well-made screws, bright or heat treated. Write for sizes and prices.

THE CLEVELAND CAP SCREW CO.
2917 East 79th Street, Cleveland 4, Ohio

Cleveland's standard line includes hex, flat, socket and fillister head Cap Screws; Milled Studs and Set Screws.

Warehouses: Chicago, Philadelphia, New York, Providence

CLEVELAND *Top Quality* FASTENERS

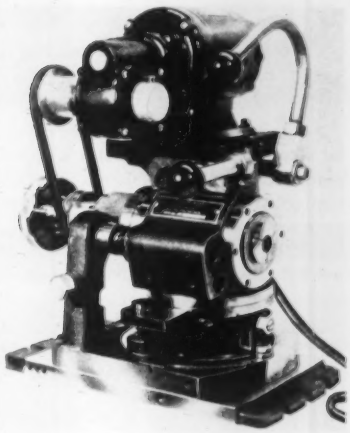
originators of the Kaufman DOUBLE EXTRUSION Process
Ask your jobber for Cleveland Fasteners

as radially. Axial control is provided by thrust bearings, in the form of double-row angular contact ball bearings, at the outboard end. Pump can be direct connected up to 1800 rpm. It is available in horizontal or vertical construction, in corrosion resistant alloys, and with steam jacketed bodies and special stuffing boxes and bearings for high temperature applications. Hopper type bodies are available for use with extremely high viscosities.

Check No. 8 on Reply Card for more Details

Exact Speed Control

Outstanding feature of the motorized radial relief grinding fixture made by D-S Grinder Division, Royal Oak Tool & Machine Co., 623 E. Fourth St., Royal Oak, Mich., is stepless speed control. It is achieved with a selenium rectifier which



makes possible speeds from 0 to 80 rpm by turning the dial knob.

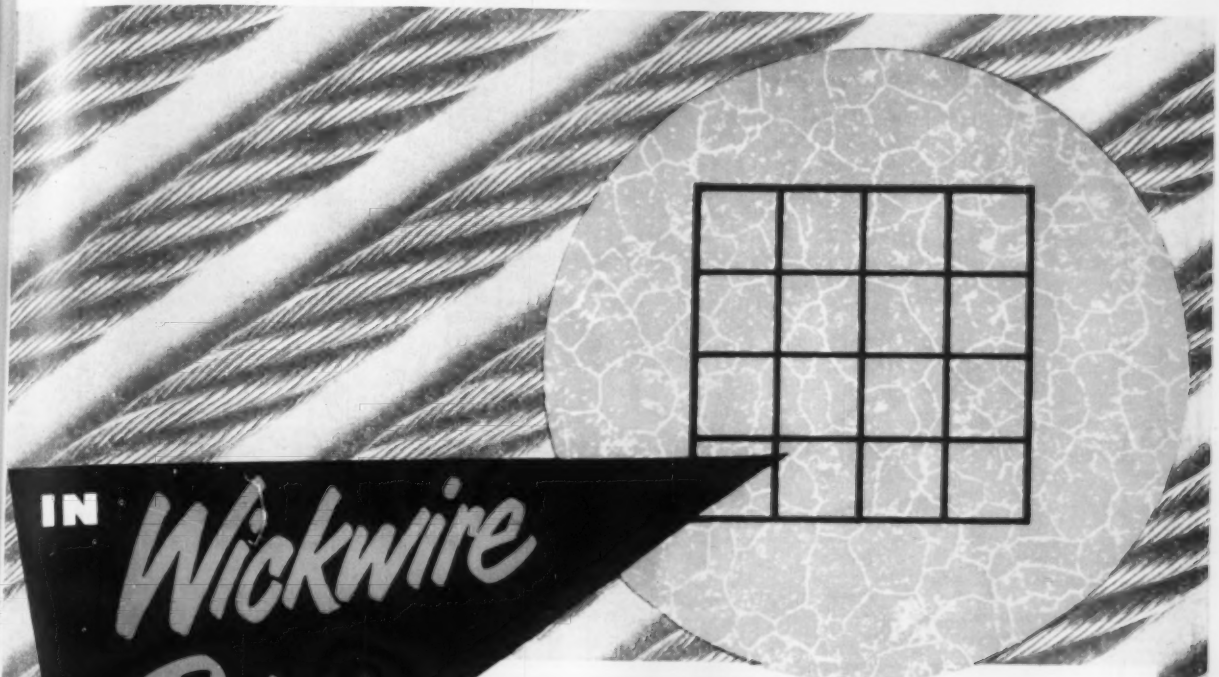
A direct current 110 v gear reduction-type motor is used offering a 40:1 ratio and giving 44 inch-pounds of torque. The fixtures which can be used with a number of standard tool grinders is offered with or without the D-S stand and grinder.

Check No. 9 on Reply Card for more Details

Mills, Planes Big Jobs

A Cincinnati combination planer and miller built to handle large work is announced by the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. Machine will receive work 126 inches wide, 108 inches high and 26 feet long. A right and left hand planer head mounted on the rail may be operated individually or simultaneously. A right hand planer side head gives the machine conventional planer advantages. Rail heads may be traversed to clear the entire table for a vertical milling head also

ALL ROPES look ALIKE... but THERE'S MORE THAN MEETS THE EYE...



IN Wickwire Rope

Rope wire viewed under a microscope with 100 magnification and the correct McQuaid-Ehn grid superimposed and matched to the sample for classification.

Yes, all wire ropes *do* look alike...on the outside. But not when you go 100 times beyond the range of normal vision. That's where you find the big difference...because that's where the grain size of the steel shows up.

Steel used for Wickwire Rope is measured for proper grain size by the exacting McQuaid-Ehn test. Typical samples are carburized to 1750° F., cooled slowly, polished and etched; then examined under a high-powered microscope for the proper matching of a McQuaid-Ehn grid to the size of the crystals. Thus, we make sure that steel going into Wickwire Rope conforms to the definite grain size that will give longest, most satisfactory service.

Such quality control of basic properties is possible only with a company like Wickwire...where manufacture is integrated from molten metal to finished rope...where the know-how of 52 years experience goes into the making of every wire rope.

It explains, too, why Wickwire Rope always gives you uniform performance, enduring reliability and longer, more economical service on the job. For the *right* rope for your particular requirements, see your local Wickwire distributor. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed. For your free copy of "Know Your Ropes" write to: Wire Rope Sales Office, Wickwire Spencer Steel Division of C.F.&I., Palmer, Mass.

WICKWIRE ROPE

CF&I & SUBSIDIARIES

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

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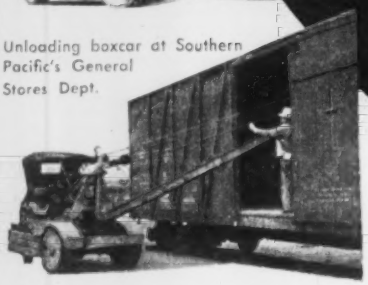
PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

Heavy Industries Use KRANE KAR SWING-BOOM MOBILE CRANE to Cut Costs by Handling Loads Easier, Faster, Safer

Stocking fittings at a Los Angeles Public Utility



Unloading boxcar at Southern Pacific's General Stores Dept.

Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company

Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

NON-FLUID OIL

TRADE MARK REGISTERED

Proved and Approved for 55 years

As the saying goes, "It must be good to be where it is today." NON-FLUID OIL has been on the market for 55 years. During this terrifically competitive period of industrial expansion, the unique drip-less, waste-less properties of NON-FLUID OIL have successfully kept pace with the lubrication needs in all phases of U. S. industry.

Huge petroleum mergers have been the order of the day during the first half of the twentieth century. NON-FLUID OIL has been able to survive and flourish in the shadow of this "sheer bigness" because it is "just a little bit better" than the best oils and greases.

NON-FLUID OIL is made in grades exactly suited to the lubrication of all types of steel mill machinery. Send for instructive bulletin and free testing sample of NON-FLUID OIL stating where it will be used.

NEW YORK & NEW JERSEY LUBRICANT CO.

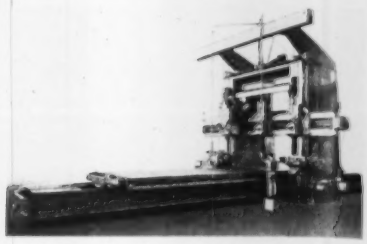
292 Madison Ave., New York 17, N. Y. Works: Newark, N. J.

WAREHOUSES: Atlanta, Ga. • Birmingham, Ala. • Charlotte, N. C. • Chicago, Ill. • Columbus, Ga. • Detroit, Mich. • Greensboro, N. C. • Greenville, S. C. • Providence, R. I. • St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

mounted on the rail. The milling head may be swiveled to reach angular surfaces on the part being machined. A left hand milling side head is provided to augment the regular machine functions.

Both milling heads are designed for heavy duty service. They have a 10-inch quill and are individually powered with a 25 to 50-hp two speed motor. Drive for milling operation furnishes electronic feed to the table in increments from 1 to 60 inches per minute. A similar milling drive is mounted on top of the arch which



supplies milling feeds to the milling head saddles of 1 to 40 inches per minute in fine increments. The electronic feed is also available to the cross rail in an up and down direction at a rate of approximately ¼ to 10 inches per minute. On the left side of the machine is mounted a 75 to 125 hp planer drive which supplies planer speeds to the table from 6.7 to 200 fpm.

Check No. 10 on Reply Card for more Details

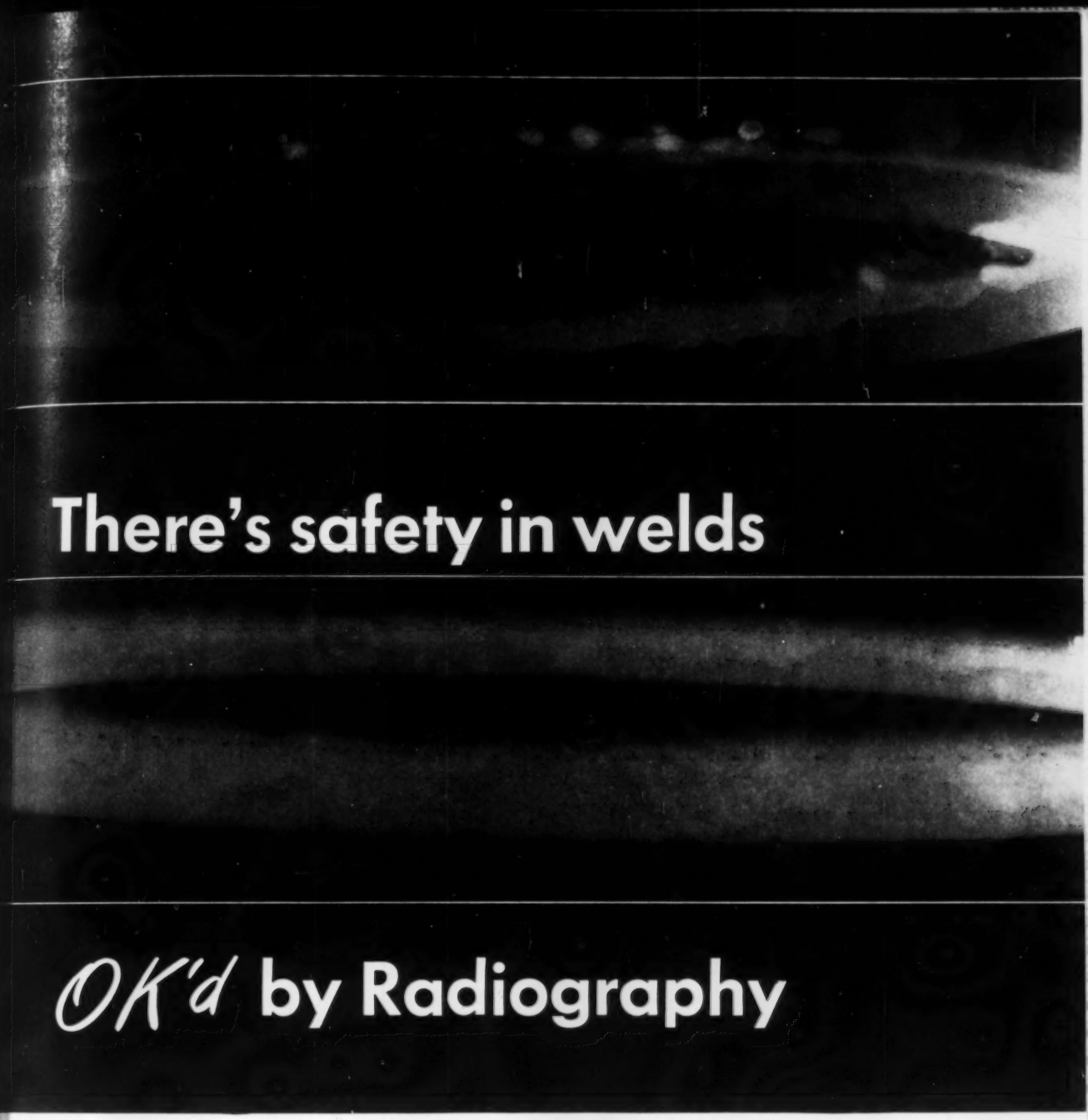
Automatic Sorting Gage

Automatic sorting gage, model 144 B-12, made by Federal Products Corp., 1144 Eddy St., Providence, R. I., will handle parts about ½-inch in diameter by ¾-inch long. The overall length is measured and each piece automatically delivered into two acceptable lengths and into over and under lengths at the rate of approximately 3600 per hour. Bushings are deposited in the hopper and the gage disposes them into the proper tote boxes. Signal lights show the operator what is going on at any point within his operating area.

Check No. 11 on Reply Card for more Details

Motor for Dirty Work

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill., has recently extended its line of type QZE totally enclosed, nonventilated, squirrel cage induction motors to include continuous duty ratings built in NEMA standard frame 284. The two models available are 7½ hp, 1800 rpm and 5 hp, 1200 rpm. Motors are identical in mounting dimensions with



There's safety in welds

OK'd by Radiography

Radiographs showing welds in gas tanks. Lower radiograph shows acceptable tank weld.

These radiographs show the welds in propane gas tanks. The upper discloses a lack of fusion and heavy gas porosities. Out of a lot of several hundred tanks, Radiography showed a dozen to be hazardous—twelve potential accidents that were prevented.

Because Radiography can prove the soundness of welds it is opening new fields to welders in manufacturing pressure vessels and in other applications where welding was once barred, it is now an accepted procedure.

This is why Radiography can help you build your business as well as earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you in your own work, discuss it fully with your x-ray dealer.

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, New York

Radiography...

another important function of photography

Kodak
TRADE-MARK

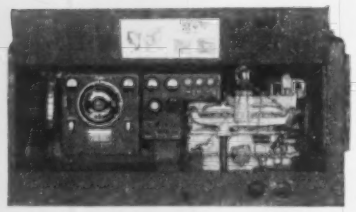
standard totally enclosed, fan-cooled motors of the same ratings. Since there are no ventilating openings to clog, these motors are suited for service in locations where dirt, dust, metal turnings, etc., are prevalent.

Ball bearings are of the cartridge type with ample grease space to permit sealing for the life of the bearing but with provisions for easy flushing and regreasing.

Check No. 12 on Reply Card for more Details

Packaged Welder-Generator

Self-contained unit consisting of a 300 amp arc welder and a 3 kw power generator is announced by Hobart Brothers Co., Hobart Square, Troy, O. Unit is powered by a 6-cylinder self-starting Chrysler indus-



trial engine directly connected to the welding generator and mounted on a welded steel frame. An auxiliary 3 kw power generator provides for lights and such tools as a lathe, grinders, drills, brake reliner, etc. It is completely enclosed by a sheet metal canopy bolted directly to the frame. Hinged side doors provide access to the control panels, engine, welding generator and other parts within the canopy.

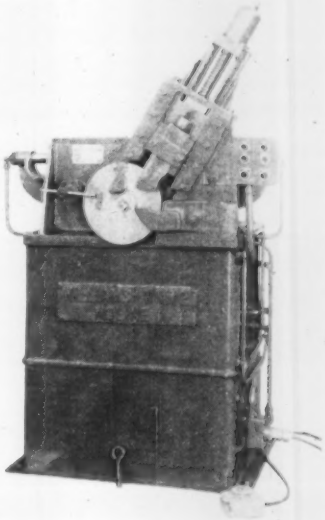
Welding generator is rated at 40 v, 300 amp under one hour resistance load at 1500 rpm and has a current range from 50 to 400 amp. A large squirrel cage type fan draws cool air in at both ends of the generator and expels heated air at the center.

Check No. 13 on Reply Card for more Details

Hydraulic Eye Bender

A hydraulic eye bender with a recommended capacity of bending 1 inch diameter round stock, hot, around a 1½-inch mandrel, is introduced by Williams-White & Co., Moline, Ill. Welded steel plate base contains a Vickers V-104-C pump with direct connected 5-hp motor, as well as an oil reservoir which is fitted with filler and drain connections and oil sight level gage.

Spindle is actuated by means of a hydraulic cylinder with rack and pinion. Reversal is accomplished by means of a solenoid operated valve which is controlled by a limit switch that can be adjusted to vary the degrees of rotation of bending spindle. Hold-down clamp is hydraulically actuated and arranged so that clamping of stock is completed before the bend-



ing spindle is rotated. Arbor is mechanically retreated or withdrawn, permitting work to fall free or be manually stripped from the machine. Control is by a footbutton mounted on a flexible cable. It may be set for single cycle operation by footbutton or continuous operation. Machine is equipped with an inching button for use when setting dies.

Check No. 14 on Reply Card for more Details

Studies Strains and Stresses

Vibration, stress and strain studies up to 50 kc and amplification up to 35,000 times are features of the H-42A Strainalyzer made by Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia, Pa. Unit makes possible the simultaneous observation and recording of four separate traces on a single 5-inch oscilloscope tube, each appearing in correct time relationship without the necessity of optical alignment.

Check No. 15 on Reply Card for more Details

Two Function Recorder

Recording of two functions simultaneously against time is accomplished with the two-pen Speedomax electronic recorder announced by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. Instrument saves tedious compilation and point-by-point plotting of data. Both functions are drawn as continuous curves on a 9⅞-inch wide chart.

Two separate electronically-ampli-

NO MORE WORRY

Sheet steel packages (domestic shipments). 8 gauge Gerrard Steel Straps secure the waterproof paper and hold steel sheets in firm, tight packages.

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Gerrard Steel Strapping Company
4745 S. Richmond St., Chicago 32, Illinois

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UNITED STATES STEEL

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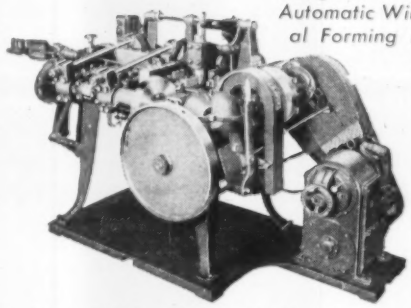

Look at a Nilson Four Slide Machine for "Formed Stampings." Nilson Four Slide Machines are fully automatic in operation. "F" Models with built-in Press pierce, stamp or swage, then form the complete piece—all in one operation. A wide range of sizes is available to handle your particular requirements most economically.

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- Versatility in Application

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fied measuring circuits, two balancing motors and two recording pens are all housed in one standard case. Circuits can be supplied to work with thermocouples, strain gages, tachometers, thermal converters or other types of primary elements. Instrument can operate controls or alarms. Recording pens operate overlapping or side by side, either across full scale or a specified portion of the full width. Speed of response for full-scale pen movement is 3, 2 or 1 second, as specified.

Check No. 16 on Reply Card for more Details

• • •

REMOTE CONTROL: A new improved mechanical remote control for Speed-Trol electric power drives is announced by Sterling Electric Motors Inc., Los Angeles 22, Calif. It permits the variable speed drives to be more adaptable on more applications where remote control from a distance is necessary. It is available in a variety of types.

Check No. 17 on Reply Card for more Details

GOOD READABILITY: Full - View type K-24 circular scale switchboard instruments are available from Westinghouse Electric Corp., Pittsburgh 30, Pa. They provide maximum readability from steepest angles and cause no objectionable shadows on the scale.

Check No. 18 on Reply Card for more Details

FOR BOILER CAPACITIES OF 300 HP: A feed water heater designed for plants with boiler capacities of 300 hp or less is announced by Swartwout Co., Cleveland 12, O. It utilizes exhaust steam to heat the water before it is delivered to the boiler. Ample water storage space eliminates the necessity for a sump or hot well.

Check No. 19 on Reply Card for more Details

OIL BURNER: Coppus Engineering Corp., Worcester, Mass., offers the new Coppus-Dennis Fanmix oil burner. It is a rotating steam atomizing burner, having an integral forced draft fan, driven by the reaction force of the fuel.

Check No. 20 on Reply Card for more Details

BRIGHTENERS FOR PLATING: Allied Research Products Inc., Baltimore 5, Md., offers new brigheners for zinc or cadmium plating. ARP No 5, for zinc plating, is good in low current density ranges and produces a bright plate with a blue chrome-type cast directly from plating solution. No. 3 is for use in higher current densities and produces a zinc plate with a bright yellow nickel-type cast. For cadmium plating, No. 4 operates throughout any current density and produces a silvery bright plate.

Check No. 21 on Reply Card for more Details

DRILL FOR STEEL: Known as the Super-Hard drill, a new carbide drill for drilling heat treated steels has been developed by Super Tool Co., Detroit, Mich. It features a long solid carbide end which tends to keep the heat that is developed in cutting away from the braze.

Check No. 22 on Reply Card for more Details

DRIVES MACHINERY: For driving medium and heavy machinery, a new combination friction clutch and brake unit have been developed by Power Presses Inc., Cleveland, O. Shoe and lining assemblies can be changed in minutes without removing the unit from the machine.

Check No. 23 on Reply Card for more Details

INCREASES CAPACITY: Feeding capacity of vibratory parts feeders made by Syntron Co., Homer City, Pa., can be doubled or tripled by equipping them with two or three feeding tracks. Movement of parts is in the same direction on all tracks and the discharges may be located all at one point or at various points around the circumference of the bowl.

Check No. 24 on Reply Card for more Details

INTERCHANGEABLE ANVILS: L. S. Starrett Co., Athol, Mass., offers a micrometer that can be used for all measurements from 6 to 12 inches by means of interchangeable anvils. Six anvils are furnished with each micrometer, which provide the full range in steps of 1 inch.

Check No. 25 on Reply Card for more Details

FRICTION CLUTCHES: Designated as type K, a new series of disk type friction clutches for stub or through shaft mounting and suitable for application to gasoline or electric motors, speed reducers and auxiliary shafts is announced by Edgemont Machine Co., Dayton 1, O. Basic model includes an integral V-belt pulley with one or two grooves.

Check No. 26 on Reply Card for more Details

DRILLS HOLES: For drilling holes through round stock from ¼ to 2 inches and hex stock and cap screws from ¼ to 1¼ inches, the new adjustable drill jig is announced by Mathewson Machine Works Inc., North Quincy 71, Mass. Hole diameters range from 0.052 to 0.531-inch using SAE standard slip bushings.

Check No. 27 on Reply Card for more Details

LOAD CENTERS: A new line of load centers, 40 to 100 amp, 1 through 20 circuits, is introduced by Trumbull Electric Mfg. Co., Plainville, Conn. Features include the TQL breaker, a plug-in, quick make, quick break breaker with thermal magnetic protection. They are constructed with removable free-floating interiors mounted on captive springs.

Check No. 28 on Reply Card for more Details

STAMPS SMALL PARTS: Numberall Stamp & Tool Co., Staten Island 12, N. Y., has designed a bench crank press for use in stamping name plates and small parts. Ram head will take type holders, numbering heads and special dies. Model 131 is hand operated; 132 air operated; 133 is motorized.

Check No. 29 on Reply Card for more Details

SIMPLIFY INSTALLATION: A new line of tube and pipe fittings including an insert flange, an aligning connector and a tube and pipe union, is announced by Horace T. Potts Co. Philadelphia, Pa. Known as Speedline, the fittings are said to simplify installation and reduce pipe line costs.

Check No. 30 on Reply Card for more Details

CONTROL SWITCH: A time delay control switch for electric solenoid valve controls used with air or hydraulic cylinders is available from Pneu-Trol Devices Inc., Chicago, Ill. It permits time dwell from ¼ to 10 seconds. Switch automatically resets itself after each actuation.

Check No. 31 on Reply Card for more Details

IMPROVED PUMP: Aldrich Pump Co., Allentown, Pa., announces improvements on their Aldrich-Lyth Hydro-Pneumatic unit. Pump is self-contained, uses normal plant air as power medium and provides high pressures at small volume. It is used in testing tubing, valves and pressure vessels, operating small molding presses, etc.

Check No. 32 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

The Market Outlook

SQUEEZE on civilian steel supplies is tightening steadily, hastening the day of widespread metalworking plant curtailments. Defense allocations are mounting. Mill tonnage set-asides for military orders are substantially upped on both carbon and alloy products starting with the April rolling cycle. Meanwhile, cutbacks up to 40 per cent in use of steel in civilian items, including automobiles, are under consideration for second quarter. This spells serious economic dislocation and unemployment, unless, by some magic, defense work spreads out through industry to take up the threatened slack.

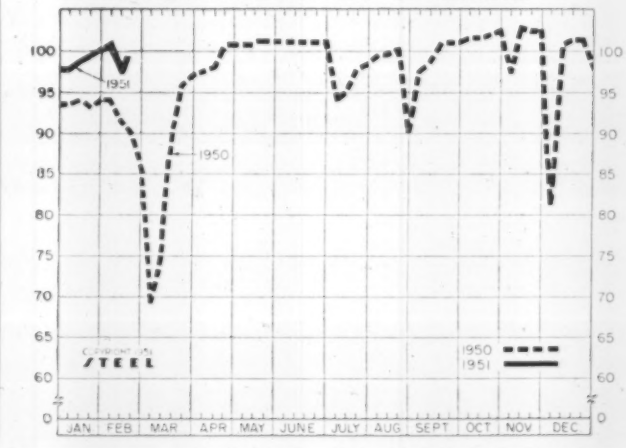
ALLOCATIONS—Moderately heavier steel tonnage is earmarked for directed programs in April. A larger grab for defense and other emergency needs is indicated for May. By that time expanding DO-rated orders will be supplemented by additional directives, leaving the non-rated consumer in tightest supply position since outbreak of the Korean war last June. New allocation programs in May likely will include ship construction, ship repairs, oil field equipment, and locomotives. These programs, along with existing delegations for domestic and Canadian freight cars, and lake ore carriers, were considered at last week's meeting of the NPA Steel Task Committee.

MILITARY TONNAGE—Speeding up of defense activities necessitated the new increase in the mandatory tonnage load on mills for military account. National Production Authority raised mill set-asides on various carbon and alloy products for DO-rated requirements just before expiration of the lead-time for April scheduling. As a result, civilian supplies of numerous carbon and alloy products will be cut further immediately to the extent of the percentage mark-up in the set-asides. Increases range from 2 to 25 per cent, sharpest hikes, 25 per cent, being on alloy mechanical tubing and alloy tube rounds. Previously the mills had to set aside 35 per cent of their scheduled production of these products. Now they must accept military orders up to 60 per cent of output. Percentage set-aside on hot-rolled carbon sheets is raised 5 points to 17 per cent, and on cold-rolled sheets 3 points to 15 per cent. Also, provision is made by NPA for projectile and shell steel, and alloy and carbon plate tonnage set-aside will be increased to 20 per cent beginning in May. DO set-aside on one product, alloy sheet bars, was cut from 35 to 5 per cent.

PRODUCTION—More steel poured from the nation's furnaces in January than in any other month in history. Output totaled 8,830,000 net tons, equal to an annual rate of 104 million tons. It surpassed the previous high month, October 1950, by 90,000 tons. Last week ingot operations recovered speedily from the slump occasioned by the railroad switchmen's strike. The national rate rose 2 points to 99 per cent of capacity, equal to output of about 1,970,000 tons. This compares with the record 2,025,000 net tons produced in the week ended Feb. 3. Loss in production due to the rail strike and industrial gas shortage is estimated well in excess of 100,000 tons.

PRICES—Whether iron and steel prices are in a deep freeze remains to be seen. Some trade authorities think necessary adjustments will be permitted from time to time as economic developments dictate. Current schedules are stabilized at levels prevailing in the closing weeks of January with the exception of scrap on which ceilings were fixed Feb. 7 effecting a rollback to levels prevailing around the first of the year. STEEL's weighted index on finished steel holds unchanged at 171.92 and compares with 156.13 a year ago.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Feb. 17	Change	Same Week 1950	Same Week 1949
Pittsburgh	98	2	95.5	99.5
Chicago	100.5	—6*	98.5	98.5
Eastern Pa.	99.5	1	75	97
Youngstown	106	0	99	106
Wheeling	97	0	91	92.5
Cleveland	91	—66*	99	100.5
Buffalo	101	0	101.5	101
Birmingham	100	0	82	100
New England	90	—5	80	80
Cincinnati	102	1	101	103
St. Louis	95	—6.5	77.5	89.5
Detroit	110	—5.5	103	106
Western	100.5	—2.5	85.5	—
Estimated national rate	99	—2	90	100

Based on weekly steelmaking capacity of 1,999,635 net tons for 1951; 1,928,721 tons for second half, 1950; 1,986,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

Composite Market Averages

	Feb. 15 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92	171.92	171.92	156.13	106.82
Index in cents per lb.	4.657	4.657	4.657	4.230	2.894
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32*	$93.18	$63.54
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.47	25.42
Basic Pig Iron, GT.....	52.16	52.16	52.16	45.97	24.75
Malleable Pig Iron, GT ...	53.27	53.27	53.27	47.27	26.04
Steelmaking Scrap, GT ..	44.00	44.00	46.33	27.67	19.17

* Revised.

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Feb. 15 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.70	3.70	3.70	3.45	2.25
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.25
Bars, H.R., del. Philadelphia	4.18	4.18	4.18	3.93	2.57
Bars, C.F., Pittsburgh....	4.55	4.55	4.55	4.10-15	2.75
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.10
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.10
Shapes, del. Philadelphia ..	3.90	3.90	3.90	3.46	2.215
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.25
Plates, Chicago	3.70	3.70	3.70	3.50	2.25
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	3.60	2.25
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.25
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.25
Sheets, H.R., Pittsburgh...	3.60-75	3.60-75	3.60-75	3.35	2.20
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.20
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.05
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.15
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	3.70
Strip, H.R., Pittsburgh...	3.75-4.00	3.75-4.00	3.75-4.00	3.25	2.10
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.10
Strip, C.R., Pittsburgh ...	4.65-5.35	4.65-5.35	4.65-5.35	4.15	2.80
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	2.90
Strip, C.R., Detroit	4.35-5.60	4.35-5.60	4.35-5.60	4.35-40	2.90
Wire, Basic, Pittsburgh ..	4.85-5.10	4.85-5.10	4.85-5.10	4.50	2.75
Nails, Wire, Pittsburgh ..	5.90-6.20	5.90-6.20	5.90-6.20	5.30	2.90
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$42.00
Wire rods, 5/32-⅜", Pitts. ..	4.10-30	4.10-30	4.10-30	3.85	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$26.25
Basic, Valley	52.00	52.00	52.00	46.00	25.25
Basic, del. Phila.	56.39	56.39	56.39	49.44	27.09
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	25.75
No. 2 Fdry, Del. Phila. ...	56.89	56.89	56.89	49.94	27.59
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.13
No. 2 Fdry (Birm.) del. Cin.	55.58	55.58	55.58	49.08	25.81
Malleable Valley	52.50	52.50	52.50	46.50	25.75
Malleable, Chicago	52.50	52.50	52.50	46.50	25.75
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa..	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts..	$45.00	$45.00	$46.50	$32.00	$20.00
No. 1 Heavy Melt. E. Pa.	43.50	43.50	47.50	23.50	18.75
No. 1 Heavy Melt. Chicago	43.50	43.50	45.00	27.50	18.75
No. 1 Heavy Melt. Valley..	45.00	45.00	46.25	31.25	20.00
No. 1 Heavy Melt. Cleve.	44.00	44.00	45.75	28.25	19.50
No. 1 Heavy Melt. Buffalo.	44.00	44.00	44.88	27.75	19.25
Rails, Rerolling, Chicago..	52.50	52.50	67.00	40.50	22.25
No. 1 Cast, f.o.b. shipping pt.	49.00	49.00	62.00	40.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl..	$14.75	$14.75	$14.75	$13.25	$7.50
Beehive, Fdry., Connlsvl...	17.50	17.50	17.50	15.50	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	9.75	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York	183.00	182.50	176.00	74.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	32.00	27.25	14.50
Nickel, refinery, duty paid.	50.50	50.50	50.50	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	58.79	59.29	....
Newark, del.	56.63	57.13	57.63	58.13
Philadelphia, del.	56.39	56.89	57.39	57.89
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.58	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9	....	52.50	53.00	....
Boston, del.	61.26	61.76	62.20	....
Rochester, N.Y., del.	54.63	55.13	55.63	....
Syracuse, N.Y., del.	55.58	56.08	56.58	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.89	54.39	54.39	54.89
Muskegon, Mich., del.	....	57.98	57.98	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.39	54.89	54.89	54.39
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	53.25	53.75	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.20	....	....
Portland, Oreg., del.	....	60.20	....	....
Los Angeles, San Francisco, del.	59.70	60.20	....	....
Granite City, Ill. K7	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.65	55.15	55.65	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.69	53.69	54.19
McKees Rocks del.	....	53.45	53.45	53.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	53.94	53.94	54.44
Verona, del.	....	54.40	54.40	54.90
Brackenridge, del.	....	54.63	54.63	55.13
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.01	57.51	....	....
Troy, N.Y., R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.26	56.76	56.76	57.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential-charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.00
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Feb. 15, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ...$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 ....62.00
Midland,Pa. C18 ....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2, U5, W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ...3.35

WIRE RODS
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester A7 .....4.40

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ...4.95
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14.3.65
So.SanFrancisco B3 ...4.20
Torrance,Calif. C11 ...4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 ....5.95
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. W16 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 .4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 ....4.95
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ...3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.95
Ashland,lcl.(15) A10 ...4.45
Cleveland,c.l. R2 .....4.30
Warren,O. c.l. R2 ....4.30

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill.(1) L1 .....3.95
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ...4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2 Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ...4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ...4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ...4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ...4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ...3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ...6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa.M12,R2 ..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ....5.10
St. Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ...4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ...5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ...5.40

RAIL STEEL BARS
ChicagoHts.(3,4)I-2, C2.4.75
Franklin,Pa.(3, 4) F5 ...4.75
FortWorth,Tex.(26) T4..5.40
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ...5.00
Williamsport(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Alton,Ill.(6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ...4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.50
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
SandSprings,Okla. S5 ..4.60
Seattle B3, N14 .....4.45
So.Chicago,Ill. R2 .....3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFrancisco B3 ...4.45
SparrowsPoint,Md. B2 ..3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 ...3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ...5.50
Johnstown, ¼-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ...5.45
SparrowsPt. ¼-1" B2..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ...3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ...3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ...3.60

SHEETS, H-R (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H-R (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ...5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 ....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 ..7.05
IndianaHarbor,Ind. I-2 ..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.85
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala., R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

ROOFING SHORT TERNES (8 lb coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, Lt. Coated Ternes, 6lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Comercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fiarfield,Ala. T2	5.30
Fontana,Cal. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
N.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10) S15	10.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	7.10	7.70	9.66	11.95
Pawtucket,R.I. NS; Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.25
NewYork W3	...	...	10.30	12.50	15.35
Pawtucket,R.I.(11) N					10.75
Pawtucket,R.I.(12) N					12.05
Sharon,Pa. S3					10.60
Worcester,Mass. A7					10.30
Youngstown C8					10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8, (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Koppers Co. Inc.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S8	4.15
Youngstown U6	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville MS	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	6.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.96	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prismth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	11.85
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle MS	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.,Cal. C11	10.60	12.50
Prismth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	9.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	4.85
Cleveland A7, C20	4.85
Crawfordsville,Ind. MS	5.10
Donora,Pa. A7	4.85
Duluth A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-sga, I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. MS	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. MS	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	7.10
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	7.10
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. MS	132
Donora,Pa. A7	130
Duluth A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So.Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville MS	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Chicago W13	123
Crawfordsville MS	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. MS	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	5.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U6	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock
To dealers & mfrs: (7)

	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	130
Cleveland A9	125
Crawfordsville,Ind. MS	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburgh,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U6	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield,S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Corp.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEELS

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	160.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (elec. furn. billet, 5.40c); to consumers, 6.15c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.9	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	38.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜"; W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24½ on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛". 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain, N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip— Cold-Rolled Carbon Base Both Sides 10%	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Sheets— Cu Base Both Sides
302				19.75	27.50	77.00
304	25.00	28.00		20.75	27.50	77.00
		29.50		24.50		
309	30.50	35.00				
310	36.50	41.00				144.00
316	29.50	31.50		26.00	36.50	
		34.00				
317	34.50	39.00				
318	33.50	38.00				
321	26.50	31.00		23.00	33.00	111.00
347	27.50	30.50		24.00	33.50	130.00
		32.00				
405	21.25	27.75				
410	20.75	27.25				
Nickel	33.25	44.25	41.00	54.00		
Inconel	41.00	53.50				165.00
Monel	34.75	45.75				
Copper*			23.70†	29.65†		

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, steel, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage Blank 18.5
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

	Reg.	Heavy
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝ in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝ in. & larger	8.5	2
C.P. Hex.		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
⅛-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish 48 & 10
Plated finishes 31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger 16
N.F. thread, all diams. 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers. List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE Diam. Inches	Length Inches	Cents per lb
17-18-20	60-72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4.5⅛	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON Diam. Inches	Length Inches	Cents per lb
40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.00	36.50	31.25
303	43.00	40.00	33.75
304	43.00	38.50	32.75
309	56.50	54.50	44.25
316	56.50	58.50	48.75
321	49.00	48.00	36.75
347	53.50	52.00	41.25
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.

Cleveland, strip A7.

Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars U5.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip C18.

McKeesport, Pa., bars, sheets except Type 416 U5.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & strjcturals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg. .26.00-33.00
Industrial xylol .23.00-33.50
Per ton bulk, ovens
Sulphate of ammonia $32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) .17.25
Do., less than carlots .18.00
Do., tank cars .15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. point in ton lots for 100 mesh, except as otherwise noted.)

Sponge iron
- 98+% Fe, carlots
- Swedish, c.i.f. New York, in bags

Electrolytic Iron:
- Annealed, 99.5% Fe
- Unannealed, 99+% Fe
- Unannealed, 99+% Fe, minus 325 mesh

Powder Flakes
Carbonyl Iron:
- 97.9-99.8%, size 5 to 10 microns

Aluminum:
- Carlots, freight allowed
- Atomized, 500 lb drums, freight allowed

Brass, 10-ton lots 30.00-33.25
Bronze, 10-ton lots 51.25-60.00
Phosphor-Copper, 10 tons
Copper:
- Electrolytic 43.25
- Reduced 38.75-41.00

Lead
Manganese:
- Minus 100-mesh 57.00
- Minus 325 mesh 72.00
- Minus 200 mesh 62.00

Nickel unannealed
Nickel-Silver, 10-ton lots
Silicon
Solder (plus cost of metal)
Stainless Steel, 302
Tin $1.02
Zinc, 10-ton lots 23.00-30.00
Tungsten: Dollars
- 99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over 4.00
- Less than 1000 lb 4.15

98.8% minus 65 mesh, freight allowed:
- 1000 lb. and over 4.15
- less than 1000 lb 4.25

Molybdenum:
- 99%, minus 80 to 200 mesh
  - over 500 lb 2.85
  - 200 to 500 lb 3.10
  - less than 200 lb 3.25
- Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connellsvll,fdry.	17.00-18.00
New River, foundry	19.50
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	24.80
Chicago, ovens	21.00
Chicago, del.	22.40
Detroit, del.	24.91
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.67
Detroit, del.	26.65
Ironton, O., ovens	21.50
Cincinnati, del.	24.06
Painesville, O., ovens	24.00
Buffalo, del.	26.12
Cleveland, del.	25.72
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.69
Philadelphia, ovens	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens	22.00
St. Louis, ovens	24.25
St. Louis, del.	25.38
Portsmouth, O., ovens	21.50
Cincinnati, del.	24.06
Detroit, ovens	24.00
Detroit, del.	*25.06
Buffalo, del.	27.04
Flint, del.	26.44
Pontiac, del.	25.39
Saginaw, del.	26.75

* Includes representative switching charge of $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (whse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65†‡	6.00	6.25	7.55
Buffalo (whse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45†‡	5.80	6.05	7.35
Pitts. (whse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10†‡	5.70	5.75	7.00
Detroit (whse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (whse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (whse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08†‡	5.78	5.93	7.13
St. L. (whse)	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88†‡	5.58	5.73	6.93
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans. City (whse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'hm (city)	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (whse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05‡	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (whse)	6.35	7.90	8.85‡	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80§	8.90‡	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60‡	9.20‡	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded); and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ‡—500 to 1499 lb; §—450 to 1499 lb; ¶—3500 lb and over; ‡‡—1000 to 1999 lb.

REFRACTORIES

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60 Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O. $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic deadburned, ¾" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Flue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950 in, applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$38-$39
Domestic scheelite, del.	nominal

MANGANESE ORE

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

	Indian and African	
48%	2.8:1	$32.50
48%	3:1	35.00-36.00
48%	no ratio	26.00
	South African Transvaal	
44%	no ratio	$24.00-25.00
45%	no ratio	20.00
48%	no ratio	$31.00-32.00
50%	no ratio	28.00-28.50
	Brazilian	
44%	2.5:1 lump	$32.00
	Rhodesian	
45%	no ratio	$20.00-21.00
48%	no ratio	26.00
48%	3:1 lump	35.00-36.00
	Domestic—rail nearest seller	
48%	3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices. Ic for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18.20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2 from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

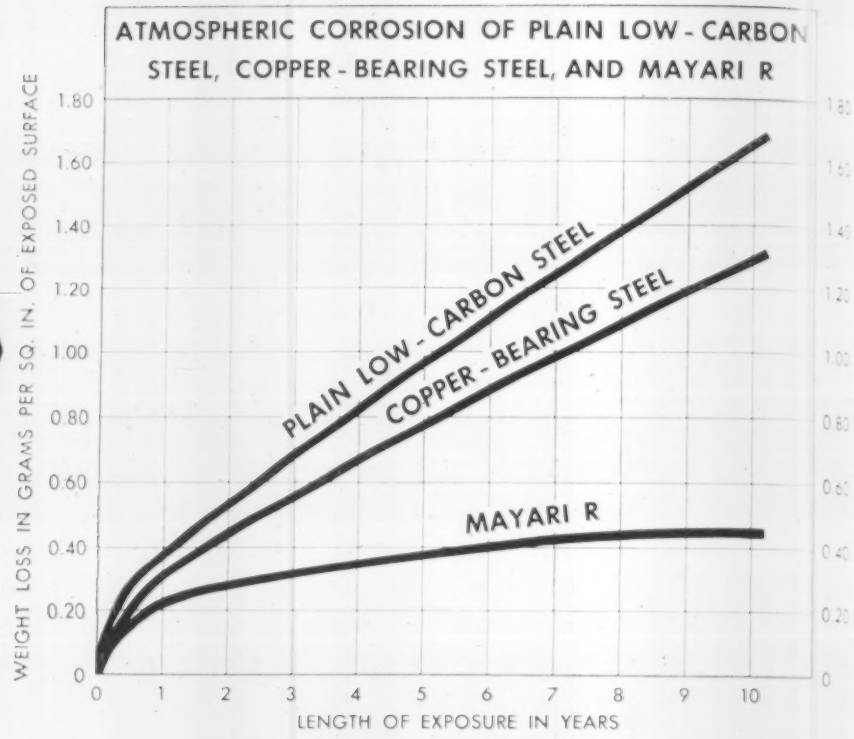
CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c, Delivered. Spot, add 0.25c.

"SM" Ferrochrome: (Cr 60-65% Si 4-6%, Mn

(Please turn to page 140)

10 YEAR TEST



shows how MAYARI R resists atmospheric corrosion

The curves plotted on this chart show the weight losses, due to atmospheric corrosion, of plain low-carbon steel, copper-bearing steel, and Mayari R. These three types of steel were exposed for a 10-year period, under exactly the same conditions, in a highly corrosive industrial atmosphere.

Relatively little difference was found in the weight losses of the three steels in the initial period. However, as the test continued, the difference in the rates of corrosion changed appreciably. The Mayari R curve became almost horizontal, indicating that corrosion had practically stopped. The other two curves continued to rise sharply, showing that corrosion continued unabated in both the carbon steel and copper-bearing steel.

It is important to note that after 10 years of exposure, Mayari R had lost no more weight than copper-bearing lost in 2 years, and no more than carbon steel lost in 1½ years.

The superior resistance to atmospheric corrosion shown by Mayari R is mainly due to the relatively thick and tightly adherent layer of rust that forms on the surface of this steel to protect it from further loss of weight.

This superior corrosion-resistance is one of the important reasons why Mayari R is now widely used in railway cars, mine cars, bridges, industrial structures, coal silos, smoke stacks and countless other applications where long service life and low-cost maintenance are essential.

For more information on this versatile grade of steel, call or write any of our sales offices.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

Mayari R *makes it lighter... stronger... longer lasting*

Metal Shortages

Some plants in Connecticut reduce work week due to zinc and copper stringency

SHORTAGES of copper and zinc are forcing some plants in the Waterbury, Conn., district to curtail some operations, mainly in the metal works divisions, to a four-day-per-week basis.

You can look for more work opportunities in the brass industries soon. Curbs on use of copper in a selected list of civilian products will be relaxed; use in a long list of non-essential products will be prohibited. This outlook is based on unofficial but authoritative reports circulating in Washington.

Despite the pressing need for copper products, deliveries of copper to fabricators dropped to 108,128 tons in January from 121,954 tons in December. However, you can expect larger deliveries later this year as the government's various forms of aid to producers become effective. Production of refined copper was slightly higher at 110,144 tons in January while stocks were 5843 tons larger on Feb. 1 at 54,883 tons.

After an initial cutback of about 25 per cent Apr. 1 in the use of copper (and aluminum) for automobiles and other consumer durable goods, restrictions will be tightened gradually until the reduction reaches about 40 per cent by July 1. These percentages are based on consumption in the first half of 1950.

Watch developments in foreign producing areas for clues to possible future help on your supply problem. Imports of blister copper totaled 220,586 tons in 1950 compared with 152,374 tons in 1949. Noranda Mines Ltd., Canada, plans development of a large low-grade copper ore property on Gaspe peninsula, Quebec province. Ore reserves are estimated at 57 million tons of 1 per cent grade, assuring at least a 30-year operation.

Noranda Mines directors authorized preparation of plans for a plant, including a smelter, which would ultimately have a capacity for processing 5000 tons of ore daily.

Army Buys Titanium

Army Ordnance Department purchased 75,000 pounds of titanium metal products from Titanium Metals Corp. of America, New York. At present prices this will cost about $1 million. Defense order numbers have been issued to speed delivery of products made of the metal. Production of titanium metal in United States during 1950 is estimated at 100,000 to 120,000 pounds.

Await Zinc Price Regulation

Imposition of a definite price ceiling on zinc, probably one covering primary metal and another scrap, will not have any noticeable effect on your costs. Prices have held unchanged for a long time and probably will be stabilized at current levels. This is the unofficial report on the orders now in the "works."

Scrap metal dealers are prohibited from accumulating inventories in excess of one-third of the tonnage of zinc scrap they received in the first half of 1950. Order M-37, issued by National Production Authority, also provides that dealers must receive prior authorization from that agency to send their scrap out for conversion to other forms while still retaining title to that scrap. Producers of zinc dust are prohibited from converting their material into slab zinc and other forms of zinc so they can get a higher price. Anyone wishing to use galvanizers' dross for any other purpose but to make dust must obtain prior written permission from NPA to do so.

Reactivates Magnesium Plant

Reactivation of Electro-Metallurgical Co.'s magnesium plant at Spokane, Wash., will not result in a larger tonnage of that metal for your civilian goods production line. The entire output of the plant, to be in production by early summer, will be sold to the government. The plant, which has been held in the national industrial reserve, will be operated under a contract by the Pacific Northwest Alloys Inc., Spokane, a subsidiary of Chromium Mining & Smelting Corp., Chicago.

Brass Scrap Freight May Rise

Establishment of a commodity rate of 28.00c on brass scrap, Boston to Torrington, Conn., has been docketed on shipments of 36,000 pounds minimum weight. The rate has been 34.00c.

METAL SAVER: Tin cans, steel barrels and manufacturing equipment resist corrosion from food and chemicals when coated with finishes containing a new General Electric chemical called R-108. G-E predicts that the chemical will extend life of steel shipping containers, protect substitutes for hard-to-get alloy steels and perhaps even replace tin now used to line food cans

Miners To Get Aid

Strategic minerals producers can look for final action soon on government's $10 million plan

OPERATORS of mining properties especially the smaller ones, will receive government aid soon. Final action is awaited on a $10 million program to speed exploration and development of critically-needed minerals, including copper, lead, zinc, cadmium, antimony, cobalt, nickel. For each dollar the government puts up for exploration and development, the company getting the money probably will have to provide an equal sum. General Services Administration will set up a number of depots throughout the United States where minerals will be purchased.

More Antimony To Be Mined

Antimony producers will obtain price relief from the government soon. Current prices for antimony, ranging upwards from 42.00c a pound, are not adequate to bring out and sustain substantial domestic production for military and essential civilian needs. There is practically no metal available. All inventories are low. Imports of the metal have decreased to the vanishing point, chiefly because producers are obtaining much higher prices abroad than they can get in this country.

Mercury Mines To Reopen

Larger supply of domestic mercury will be made available later this year. Plans are being developed by the government to assure some increase in production in this country and limited program will be put into effect at an early date. Only one of the companies which accounted for 80 per cent of the mercury mined in the United States during World War II is now operating. Most of the other operators will be able to reopen their mines if assured of an adequate price floor for a long enough time to justify the expense involved.

The government is considering a proposal to guarantee a market for from one to four years at a minimum price for the metal. The amount of mercury that could be produced depends upon price.

Spain's giant mercury trust has been holding out for higher prices since the Korean war's start and has been limiting current shipments to about 250 flasks each. Spain's mercury production in 1950 rose to 50,000 flasks from 32,000 in 1949.

United States production equalled or exceeded domestic consumption during only three periods since 1910. In 1949, when domestic production of 9930 flasks of 76 pounds each was the smallest since 1933, imports totaled 103,141 flasks. Current domestic production is lowest in over 100 years.

General Dry Batteries Inc., Cleveland, has established a market for used mercury cell hearing-aid batteries to help ease the shortage. Payment to dealers will be made on a schedule of prices ranging up to 4 cents for each battery.

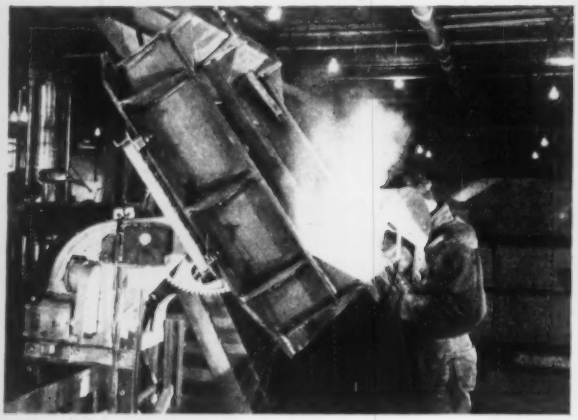
Give your welder a chance to be proud of his footage!

It's *waste welding time* when welders have to climb over, prop up or flop the work piece to get at the different seams.

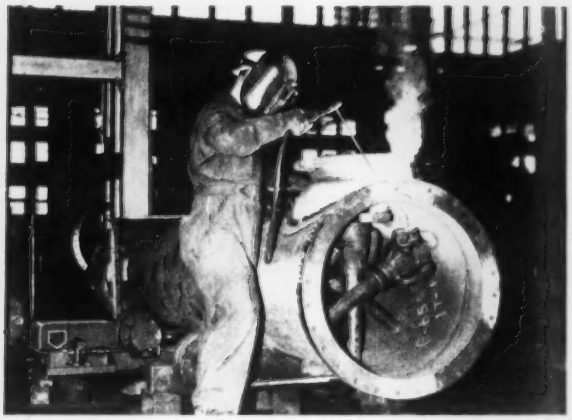
It's *all arc-time* when Worthington-Ransome Turning Rolls and Welding Positioners are used. All welds can be tilted or turned into position—without delay—for continuous downhand welding.

Result—up to 50% more footage, *better* welds (using higher current and heavier rods), less welding rod waste.

Write Worthington Pump and Machinery Corporation, Dunellen, New Jersey, for bulletins or additional information.



With one set-up, work piece may be tilted and rotated for either automatic or manual welding. Welding Positioner capacities from 100 lb to 30 tons.



Production goes up on manual or automatic welding, whether repetitive or job work. Turning Rolls from 3 to 150 tons, stationary or self-propelled.

WORTHINGTON

Y1-1

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.61½c, delivered.

Brass ingots: 85-5-5-5 (No. 115) 29.00c; 80-10-10 (No. 215) 43.25c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.00c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.60c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.00-30.50c; No. 12 foundry alloy (No. 2 grade) 29.50-30.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.00c; grade 2, 30.00-30.25c; grade 3, 29.00-29.50c; grade 4, 28.50-29.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt, 183.00c; Feb. 183.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%, nominal.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $216-$220 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 39.93-41.68; yellow brass 36.86-38.28; commercial bronze, 95%, 39.91-41.61; 90%, 39.48-41.13; red brass, 85%, 38.54-40.14; 80%, 38.12-39.67; best quality, 39.15; nickel silver, 18%, 50.37-51.91; phosphor-bronze grade A, 5%, 58.49-60.20.

Rod: Copper, hot-rolled 35.78-37.53; cold-drawn 37.03-38.78; yellow brass free cutting, 31.26-32.63; commercial bronze, 95%, 39.60-41.30; 90%, 39.17-40.82; red brass 85%, 38.28-39.83; 80%, 37.81-39.36.

Seamless Tubing: Copper 39.97-41.72; yellow brass 39.87-41.29; commercial bronze, 90%, 42.14-43.79; red brass, 85%, 41.45-43.05; 80%, 42.58.

Wire: Yellow brass 37.15-38.57; commercial bronze, 95%, 40.20; 90%, 39.77-41.42; red brass, 85%, 38.83-40.43; 80%, 38.41-39.96; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-29.42, l.c.l. 29.17-29.92. 100,000 lb lots 28.545-29.295; weatherproof, f.o.b. eastern mills, c.l. 29.60, l.c.l. 30.10, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	28.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4,	—Hexagonal— R317-T4	178-T4
	178-T4		
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.813	41.5	....	....
0.375	40.0	48.0	48.0
0.406	40.0	....	....
0.438	40.0	48.0	48.0
0.469	40.0	....	....
0.500	40.0	48.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	38.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq. ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill pate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 37.69c; oval 37.19c; cast 37.375c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl, 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chrolide (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound delivered eastern refineries, carload lots)

No. 1 copper 25.00; No. 2 copper 22.00; light copper 20.00; composition red brass 22.50-23.00; radiators 17.75-18.00; heavy yellow brass 17.75-18.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry copper content 19.50.

* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 21.50; No. 2 20.00; light copper 19.00; No. 1 composition red brass 19.00-19.50; No. 1 composition turnings 18.50-19.00; mixed brass turnings 13.50-14.00; new brass clippings 17.50-18.00; No. 1 brass rod turnings 16.00-16.50; light brass 13.50-14.00; clean heavy yellow brass 15.25-15.75; new brass rod ends 16.50-17.00; auto radiators 15.50-16.00; cocks and faucets, 17.50-18.00; brass pipe 18.50-19.00.

Lead: Heavy 15.00-15.25; battery plates 8.75-9.00; linotype and stereotype 15.50-16.00; electrotype 15.00-15.25; mixed babbitt 12.25-12.50.

Zinc: Old zinc 11.00-11.25; new die cast scrap 10.75-11.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 80.00-85.00; block tin pipe 125.00; No. 1 babbitt 75.00-80.00.

Aluminum: Clippings 2S 19.00-19.50; old sheets 15.50-16.00; crankcase 15.50-16.00; borings and turnings 12.00-12.50.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 13-15	24.50	16.80	17.50	183.00	19.00	42.00	50.50	90.16
Feb. 1-10	24.50	16.80	17.50	182.50	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	42.00	50.50	90.16
Jan. 29-31	24.50	16.80	17.50	183.00	19.00	42.00	50.50	90.16
Jan. 26-27	24.50	16.80	17.50	182.00	19.00	42.00	50.50	90.16
Jan. 25	24.50	16.80	17.50	183.00	19.00	42.00	50.50	90.16
Jan. 24	24.50	16.80	17.50	180.00	19.00	42.00	50.50	90.16
Jan. 23	24.50	16.80	17.50	178.00	19.00	42.00	50.50	90.16
Jan. 22	24.50	16.80	17.50	176.00	19.00	42.00	50.50	90.16
Jan. 19-20	24.50	16.80	17.50	175.50	19.00	32.00	50.50	90.16
Jan. 18	24.50	16.80	17.50	175.75	19.00	32.00	50.50	90.16
Jan. 17	24.50	16.80	17.50	176.00	19.00	32.00	50.50	90.16
Jan. 16	24.50	16.80	17.50	175.00	19.00	32.00	50.50	90.16

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits ,del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, effective Feb. 7, 1951.

STEELMAKING SCRAP COMPOSITE

Feb. 15	$44.00
Feb. 8	44.00
Jan. 1951	46.33
Feb. 1950	27.52
Feb. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade 1)

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	40.00	42.00
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 heavy melting steel) for other grades of dealer and industrial scrap.

Open-hearth and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Electric Furnace and Foundry Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate Scrap	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
20. Foundry Steel, 2 feet and under	+ 2.00
21. Foundry Steel, 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00

Restrictions on Use

(1) Prices for Grades 11, 23 and 24 may be charged only when shipped to a consumer directly from an industrial producer of such grades; otherwise ceiling prices shall not exceed prices established for the corresponding grades of basic open-hearth and blast furnace scrap.

(2) Prices established for Grades 26 and 27 may be charged only when such grades are sold for use for chemical or annealing purposes; otherwise ceiling prices for such grades shall not exceed the price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price for such grade shall not exceed the ceiling price established for the corresponding grade of basic open-hearth.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $4; 75% and over, $6; less than 75%, $10.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
22. Uncut Bolsters & Side Frames	Base
23. Cut Bolsters & Side Frames	+ 3.00
24. Angle & Splice Bars	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling price for such grade shall not exceed ceiling price established for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling price for such grade shall not exceed ceiling price established for No. 1 heavy melting steel.

CAST IRON SCRAP

Ceiling price per gross ton for any of the following grades of cast iron scrap shall be the price shown in the following table, f.o.b. shipping point.

1. Cast Iron, No. 1 (Cupola Cast)	$49.00
2. Cast Iron, No. 2 (Charging Box Cast)	47.00
3. Cast Iron, No. 3 (Heavy Breakable Cast)	45.00
4. Cast Iron, No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery Cast	52.00

Restrictions on Use

(1) Ceiling shipping point or on-line price which a basic open-hearth consumer may pay for No. 1 cast iron, No. 1 wheels, clean auto cast or malleable shall be the ceiling price established for No. 3 cast iron.

(2) Ceiling shipping point or on-line price which any foundry consumer other than a malleable iron producer may pay for Grade 10 shall be the ceiling price established for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin which is allocated by the National Production Authority to a consumer, shall be as follows:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.

(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

(4) For preparing into Grade No. 25, $6.

(5) For preparing into Grade No. 19, $6.

(6) For preparing into Grade No. 12, Grade No. 13, Grade No. 14, or Grade No. 18, $10.

(7) For preparing into Grade No. 17 or Grade No. 21, $10.

(8) For preparing into Grade No. 16 or Grade No. 20, $10.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be as follows:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

(3) For preparing into Grade No. 16, $4.

(4) For preparing into Grade No. 17, $5.

(5) For preparing into Grade No. 18, $7.

(6) For preparing into Grade No. 21, $4.

(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron shall be limited to the following:

(1) For preparing Grade No. 8 into Grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and the consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless the consumer obtains prior written approval from OPS.

No preparation charge other than the charges set forth above may be made for the preparation of any grade of iron or steel scrap unless the consumer has secured prior written approval of such charges from OPS.

Commissions

No comissions shall be payable on sales made under this regulation except by a consumer to a broker for brokerage services rendered to the consumer. Where scrap is allocated by NPA other than from a government agency, the seller may designate a broker. Where scrap is allocated by NPA from a governmental agency, the consumer may designate a broker. In the event that a broker purchases iron or steel scrap for sale to a consumer, such consumer may pay such broker a commission not exceeding $1 per gross ton. The regulation specifies under what conditions the broker commission may be paid.

Unprepared Scrap

The term "unprepared scrap" shall not include such demolition projects as bridges, box cars or automobiles, which must be so priced that the prepared scrap will be delivered to the consumer within the established ceiling delivered prices.

For unprepared steel scrap other than materials suitable for hydraulic compression, the ceiling basing point prices shall be $8 per gross ton beneath the established ceiling price of the prepared base grades, No. 1 heavy melting or No. 1 railroad heavy melting steel.

For unprepared material which when compressed constitutes No. 1 bundles the ceiling basing point price shall be $6 per gross ton beneath the ceiling basing point price for No. 1 bundles; or when compressed constitutes No. 2 bundles the ceiling basing point price shall be $8 per ton beneath the ceiling basing point price for No. 2 bundles.

Any iron casting which cannot be broken with an ordinary drop into Grade No. 2 or Grade No. 1 may not be classified as Grade No. 3. Where such iron casting requiring blasting or other special preparation is sold to a consumer of scrap, the shipping point price for Grade No. 3 must be reduced by the amount of the additional charges required for preparation.

Premiums for Alloy Content

No premium, except those listed below, may be charged for alloys contained in iron and steel scrap. Except as outlined below the premiums are not confined to a particular use.

Nickel—A premium of $1.25 per gross ton for each 0.25 per cent may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel where the scrap contains not less than 1 per cent and not over 5.25 per cent nickel.

Molybdenum—A premium of $2 per ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than 0.15 per cent molybdenum. A premium of $3 per ton may be charged in addition to the applicable ceiling price for No. 1 heavy melting steel for scrap containing not less than 0.65 per cent molybdenum.

Manganese—A premium of $4 per ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 per cent manganese and is in sizes larger than 12 in. x 24 in. x 8 in. A premium of $14 per ton over the applicable basing point price for No. 1 heavy melting steel or No. 1 railroad heavy melting steel may be charged where scrap contains not less than 10 per cent manganese and is cut in sizes of 12 in. x 24 in. x 8 in. or smaller. These manganese premiums are only applicable if the scrap is sold for electric furnace use, except on allocation by NPA.

Chromium—Steel scrap conforming to SAE 52100 may command a premium of $1 per ton in addition to the applicable ceiling price for the corresponding grade when sold for electric furnace use only, but in no event shall the ceiling price plus the premium provided exceed the ceiling price for No. 1 heavy melting steel plus $1.

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Sheets, Strip . . .

Sheet and Strip Prices, Page 121 & 122

Boston—Heavier plate production on sheet and strip mills is ahead. Some units have gone over to plates and more will do so when reductions in use of steel for major heavy consumer goods and appliances are effective. Rated orders for carbon and low-alloy high-strength sheets are heavier and product limitations have been raised again; hot-rolled from 12 to 17 per cent; cold-rolled, 12 to 15 per cent; hot-rolled strip, 10 to 12 per cent. May will bring sharp increase in rated and program volume with another decline in allocations to nondefense consumers. Many users of stainless are revising specifications to straight chromium. Pressure is heavier for shank steel, a cold strip product.

New York—Dislocations in metalworking likely as result of increasing emphasis on defense work will work hardships at various sheet consuming plants. However, steel mill operations will be little affected, as demand will continue well in excess of supply. Stringency in galvanized sheets is increasing because of shortage of zinc.

Philadelphia—With a carry-over from March likely and extension in minimum quotas on DO-rated orders of 5 per cent announced just before expiration of the lead-time, civilian sheet allocations for April will be smaller than in March. But some producers say the extension of the DO-rated quotas means little as they have been accepting military work on a heavier scale than required. However, overall effect is a tightening on non-rated tonnage, and in May the tightening will be much more pronounced.

Pittsburgh—Return of the "sick" switchmen to their jobs is resulting in rapid clearing up of the traffic snarl in this area. It will take at least two weeks for mill shipments to be restored fully to normal in the case of several producers, however. No production was lost because of shipment delays, makers simply piling the finished steel and shipping out as they could by truck. More tonnage was lost due to shutdowns occasioned by shortage of natural gas than by the rail tieup. Wildcat strike at the West Leechburg plant of the Allegheny Ludlum Steel Corp. has been settled.

Cleveland—Further pinch on civilian supplies of flat-rolled looms with the upping of the set-aside for rated orders. Set-aside on hot-rolled carbon sheets is increased 5 points to 17 per cent; cold-rolled sheets 5 points to 15; galvanized sheets 3 points to 10; hot-rolled and cold-rolled strip 2 points to 12. Enameling sheet set-aside is unchanged at 5 per cent, as is nonalloy silicon sheets at 7.

Cincinnati—Sheet mills maintained schedules during the recent switchmen's strike, but a shortage of freight cars is a handicap to normal shipping. District mills lost only slight tonnage due to shortage of gas; more serious slip in output was reported at Armco's plants in Butler and Zanesville.

Chicago—Civilian users of sheets and strip will get bad news when mills advise them of their quotas starting April. The new increased set-aside percentages for DO orders were transmitted by NPA to producers in time to beat the 45-day lead time for that month and every mill has customers waiting with more than enough unplaced rated business to fill the space opened up. Affected most are hot-rolled sheets up from 12 to 17 per cent, cold-rolled going from 12 to 15, and galvanized and other coated from 7 to 10 per cent. Hot and cold-rolled strip are moved from 10 to 12 per cent. Sheet and strip demand is overwhelming and each boost in DO set-aside makes the future outlook more dim.

Birmingham—Sheet supply grows progressively worse. Steel mill officials say they are beset with persistent requests for tonnage and are up against an impossible problem, despite consistently high production.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 121

Seattle — Reinforcing bar order backlogs extended to midyear. Demand for small tonnages has declined somewhat due to federal controls, but several major reinforcing bar projects are pending.

Steel Bars . . .

Bar Prices, Page 121

Cleveland—Rising pressure of military and other emergency demand on the bar makers is indicated by the increase in mill set-aside ordered by the National Production Authority. Expectations are buyers on civilian account will find the going increasingly rough as the weeks pass and more rated business appears to further extend mill bookings.

Under the NPA revised set-aside schedule, beginning in April, projectile and shell steel takes 35 per cent of the mill hot-rolled bar obligation of 15 per cent of total tonnage. Hot-rolled bars, including light shapes, upped 3 points to 15 per cent; reinforcing bars increased 5 points to 20 per cent; cold-finished bars, 15 points to 25 per cent.

An important producer of alloy bars in this general area is having operating difficulties due to the shortage of scrap. This producer is operating only four of eight electric furnaces at present and its order books are bulging with tonnage which would support capacity operations into July.

Chicago — Starting with April or the May-June rolling cycle depending upon mill scheduling procedure, DO orders will command 15 per cent of hot-rolled carbon bar output and 45 per cent of alloy. This is in line with NPA increase in set-aside ordered last week. The increase is 5 per cent for carbon and 10 per cent for alloy. Cold finished carbon bars jump from 10 to 25 per cent and alloy from 25 to 40 per cent. Mills have more than enough rated tonnage waiting to fill the newly made space. The push-ups mean that bars for civilian account will get the squeeze, thus hastening the day of manufacturing plant curtailments.

Boston—Nondefense carbon bar allocations for April are off approximately 25 per cent from the basic pattern and 9 to 10 per cent lower than in March. Product limitation for hot-rolled carbon and low alloy high strength, required acceptance on rated tonnage, has been raised from 10 to 15 per cent with projectile quality subject to negotiation. Chemical extras, with variance of $5 per ton on some grades, tends to dislocate order load, notably high manganese and sulphur specifications. Tungsten and molybdenum limitations are also fostering substitutions.

Philadelphia — Cold-finished bar sellers are booked through August on some DO-rated specifications, although still in position to take a little June business. One leading seller estimates DO-rated orders constitute about 25 per cent of total bookings. Cold-finished is going into such rated work as aircraft, rockets and shells, and the building of military trucks and busses.

Pittsburgh—Rising DO requirements are noticeably tightening supply of merchant bars. While bulk of tonnage moving is on unrated orders the proportion is steadily shrinking as producers become further committed on rated tonnage. Some relief may be experienced in April from the pressure since indications are mandatory cutbacks, up to 40 per cent in use of steel, copper, aluminum and other critical metals in production of civilian goods, including automobiles, are reportedly under consideration for imposition that month.

Seattle — Demand for merchant bars is above normal. Proposed government construction in Alaska will absorb large tonnages during the coming season.

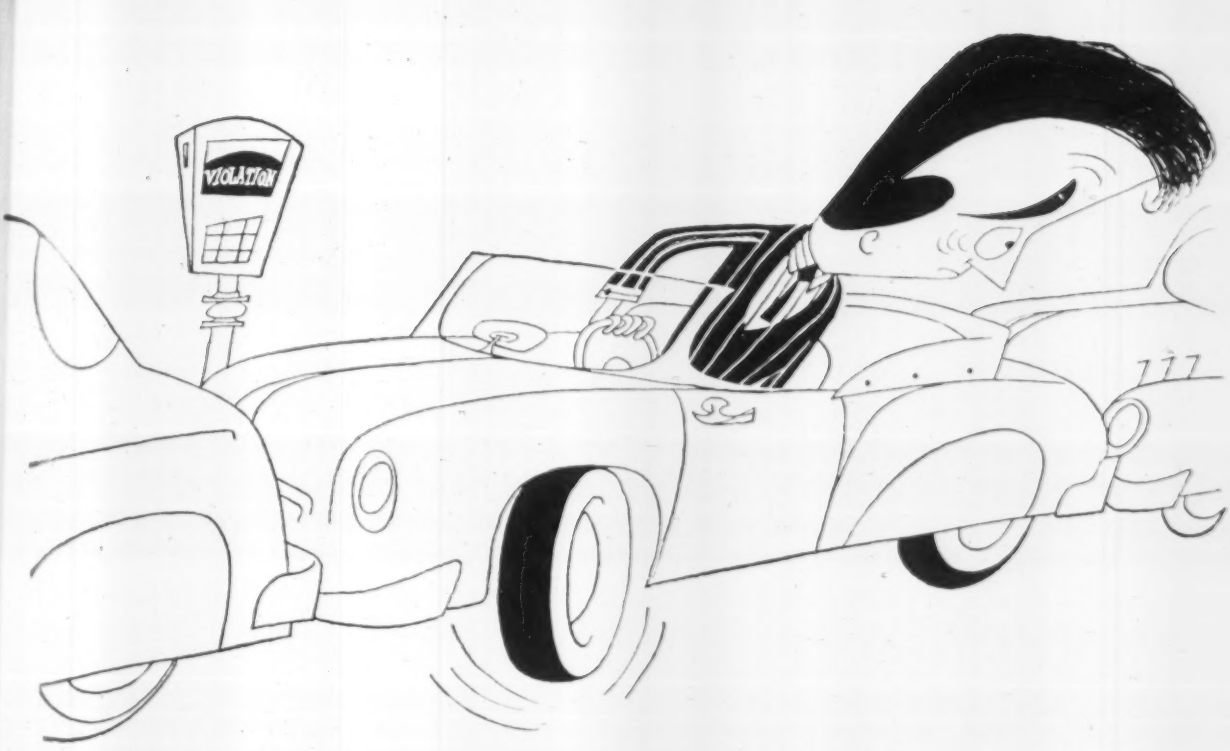
Plates . . .

Plate Prices, Page 121

Pittsburgh — Emergency tonnage load on the plate mills is increasing. Producers anticipate steady shrinkage in volume available to unrated classifications with various new defense and related programs in the offing. Currently, pressure is on the mills for railroad car tonnage. The car program is lagging behind schedule, output running at only about 6000 units monthly whereas it had been hoped to attain a 10,000-unit pace. Indications are it will be late summer before even a 9000-unit monthly rate will be attained for the reason operational difficulties, in addition to steel supply, have presented a high hurdle in shaping production plans of the separate carbuilders. Meanwhile, need for cars is mounting daily, rail traffic to date this year being estimated 20 per cent above the like period in 1950.

Boston—Plate order backlogs are out of balance on quality grades involving hot-topped material. High ratio of bookings are for high strength steel and other grades taking hot-topped ingots, representing requirements for car-building, liquid petroleum gas containers, heavy weldments and rolled armor plate. Orders for forged armor plate are light. New program on which bids are in and carrying ratings include several thousand tons for underground tanks at naval shipyards and stations.

New York—Minimum DO-rated order quotas have been stepped up on plates five points to 20 per cent, effective with May rollings. This com-



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bined with new directive programs which also will go into effect at that time will considerably tighten the supply of plates to non-rated consumers. Actually some tightening will take place in April, as indicated by civilian allotments last week.

Philadelphia—With expiration of the 45-day lead time plate producers generally have allocated non-rated tonnage for April, thus rounding out schedules for that month. DO-rated orders and directive business have already been extended. Some mills have not closed the door completely, for in allocating civilian tonnage they made it subject to last minute directives for emergency needs. Even this qualification wasn't expected to last more than a few days beyond expiration of the regulation lead time.

Seattle—Unstated tonnages of plates are involved in four 27-foot penstocks and tunnel liner plates for the Cabinet Gorge power project. Several water tank jobs, less than 100 tons each, are up for figures.

Structural Shapes . . .

Structural Shape Prices, Page 121

New York—Fabricators and builders are moving cautiously pending further clarification as to steel supply. An interesting development is the rejection of all bids on the 9415-ton Captree state park bridge development for the Jones Beach Parkway Authority, Suffolk county, New York. Some interpret this development as lending weight to the word recently passed along to Governor Dewey by Charles E. Wilson, defense mobilization director, that little or no structural steel will be available for public works, except schools and hospitals, after mid-year.

Structural work will come in for further restriction as result of the Federal Reserve Board's action limiting loans for the building of offices and a number of other types of structures to 50 per cent of the value of the property.

Boston—Inquiry for fabricated steel for bridges is slow, but some state departments are placing steel contracts direct and establishing project completion dates on receipt of bearing piles and structurals. Most outstanding contracts for schools, approximating 1000 tons, have been placed at high prices, 15.00c and up per pound in place. Shops are frequently forced to pay premium prices for plain material to meet commitments.

Philadelphia—While the structural market is quiet, inquiries being small and awards scattered, considerable industrial work is in prospect. Work of less importance to the emergency is lagging.

Pittsburgh—Nonrated orders on structural mills are steadily being shoved into the future as more defense tonnage develops. Fabricators report ban on certain types of construction has definitely resulted in a falling off in inquiry for commercial and recreational building. However, industrial construction is rising noticeably, one large fabricator here reporting January bookings of this class of work being up more than 15 per cent above a year ago. U. S. Steel Co. has added Clairton, Pa., as a mill price base for wide flange structurals. It also has added Gary as a base on alloy structurals.

Seattle—Fabricators' order backlogs are increasing. Operations will step up shortly. Awards of small tonnages are numerous. Scarcity of wide flange shapes and plates is pronounced with deliveries extended 60 to 120 days. Demand for structurals is active, particularly for Alaska projects.

Semifinished Steel . . .

Semifinished Prices, Page 121

Pittsburgh—Large projected increase in primary steelmaking capacity assures adequate supplies of semifinished to support expanded finishing facilities within two years. Steelmakers are pushing building plans in an effort to get new plants into operation as quickly as possible. Expectations are some works will be ready well before scheduled completion dates. Large equipment contracts are being let and steel mill equipment builders are reported booked full far into the future. Last week Koppers Co. was awarded contract for the engineering and construction of nine 275-ton openhearths at the new Fairless Works of U. S. Steel Co. at Morrisville, Pa.

Birmingham—January was one of the best production months in years in this district. Output of ingots ran from 106 to 108 per cent of rated capacity despite temporary shutdowns due to shortage of gas. Steel officials report moderate increase in DO orders.

Wire . . .

Wire Prices, Page 123

Boston—Rated orders for alloys are heavier, extending well through second quarter, although in some cases lead time for April scheduling has been narrowed. Civilian allocations for that month are lower, but sharper reductions are indicated for May. Cold heading wire demand is mounting with more orders going to screw manufacturers for aircraft. Annealing, galvanizing and other processing departments are taxed, although rod supplies are tight. Large defense orders for signal wire are in process, three-strand material taking two steel or aluminum and one copper strand. While cutbacks in automotive releases are expected, few have actually taken place.

Cleveland—Consumer pressure for wire items continues unabated and the stringency in supplies is becoming increasingly acute. Recent shipping difficulties stemming from the switchmen's strike have contributed to consumers' supply troubles but conditions on this score are rapidly getting back to normal. NPA order on mill set asides for rated tonnage has been revised and now ranges from 5 to 10 per cent. For the most part the old schedule called for 5 per cent of production. Under the revised set-aside schedule, drawn wire, low carbon, now gets 10 per cent; high carbon wire 15; nails and staples 5; barbed wire 5; woven fence 5; bale ties 5.

Birmingham—Consumers of wire products, especially nails and fencing, are increasingly hard pressed for supplies. Steel mill officials say the general picture is "more ratedly darker" in all specifications as the result of a "gradual increase" in DO orders and government directives.

Tubular Goods . . .

Tubular Goods Prices, Page 124

Los Angeles—Chrome furniture manufacturers, able to get tubing by facing restrictions on use of chrome after Apr. 1, are scrambling for DO orders to keep in business. Their big question is: Will defense business come soon enough?

San Francisco—Consolidated Western Steel Corp., fabricating subsidiary, United States Steel Corp., has been able to relieve plant congestion after having been forced to store large diameter steel pipe because of the shortage of freight cars growing out of the railroad switchmen's strike.

Seattle—Increased demand for cast iron pipe is noted with opening of the season. Selling agencies are handicapped by slow deliveries and keener competition from other types. Due to prolonged delivery, bid calls usually ask for alternatives.

Rails, Cars . . .

Track Material Prices, Page 123

New York—Buying of 26,356 domestic freight cars in January was the heaviest in the last quarter century, except for July, 1950, when 30,965 cars were purchased, says the American Railway Car Institute. Of the January total 19,166 cars were placed with commercial shops and 7190 with the railroad shops. Deliveries comprised 5949 cars, against 5700 the preceding month. Orders on hand Feb. 1 comprised 140,758 cars, of which 103,779 were at commercial shops and 40,979 at railroad shops.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 124

New York—The bolt and nut industry is facing a critical steel supply situation. One Middle West plant is down completely and others are curtailing in varying degrees.

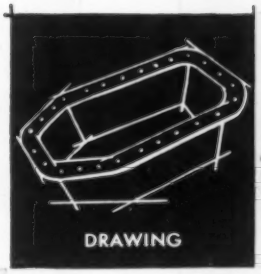
This situation is already adversely affecting large consumers, such as agricultural equipment interests and machine tool builders.

A large unit of one fastener manufacturer now has on hand about 15 per cent of the steel required to operate the plant for a month. There is a particular shortage of nut stock, as compared with bolt steel.

As a result of restricted operations order backlogs are mounting rapidly. On some items a leading manufacturer has a backlog of ten months, although on some others no more than three months.

Industry leaders are trying to obtain some relief through Washington.

Pittsburgh—With fastener producers under growing pressure for supplies for the defense industries their steel procurement problems are becoming increasingly difficult. They have been seeking allocation of



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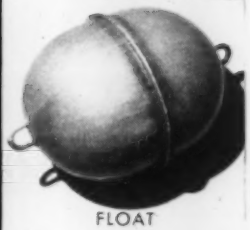

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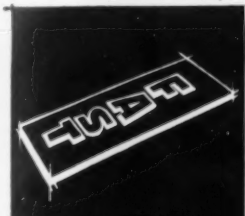
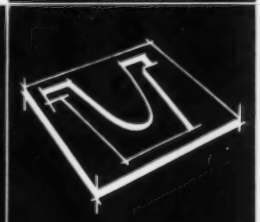


EMBOSSING



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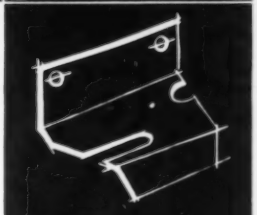

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3693 DUWAMISH AVENUE • SEATTLE 4, WASHINGTON

steel against emergency requirements of bolts, nuts and rivets, especially for railroad cars. But so far all that has resulted have been discussions in Washington. Meanwhile, steel used for production of items for essential programs is taken from regular mill tonnage which leaves the bolt and nut makers short of supplies for the regular trade.

Iron Ore . . .

Iron Ore Prices, Page 125

Youngstown—Republic Steel Corp.'s Youngstown plant will begin receiving shipments of Liberian iron ore by spring. The ore, testing about 68 per cent iron, will be used mainly as open hearth charge ore. The Baltimore & Ohio railroad is building a $5 million ore dock at Baltimore to unload this ore and shipments from Venezuela. It recently cut the freight rate on imported ores from Baltimore to Youngstown.

Youngstown Sheet & Tube Co. is buying about 20,000 to 25,000 tons of Brazilian ores monthly for its Youngstown open hearths. The ore tests about 68 per cent iron, comes in lumps making it particularly suitable for open hearth use.

Pig Iron . . .

Pig Iron Prices, Page 120

Boston—Several small foundries, down in the post war period, have reopened and others will resume if pig iron is available. Most shops under contract with the district furnace are taking full commitments and seeking additional tonnage.

New York—As more foundries extend schedules beyond five days a week, pressure for pig iron intensifies. There has been little or no pickup in production by furnaces supplying this area and shipments of imported iron have not been up to expectations.

Philadelphia — Steel plants and foundries are finding it increasingly difficult to maintain operations because of the scarcity of metallics. Domestic pig iron supply is short, and foreign tonnage disappointing. Indications point to fewer offerings from abroad as time goes on. Argentina is competing for Chilean iron, with the possibility shipments to the United States may drop sharply in summer. Meanwhile, importers of Chilean iron are extending delivery promises to late May and June. Melters also are finding scrap more difficult to obtain.

Pittsburgh—Traffic conditions are improving with the rail switchmen back on the job. Movement of pig iron from furnaces is virtually back to normal. Car shortage during the period of the strike slowed down shipments at some plants as much as 40 per cent but furnace operations were maintained without interruption. Merchant furnaces are under increasing pressure from the foundries despite the 30-day limitation on inventories, indicating few shops are stocked to the limit of the government allowance.

Cleveland—Ending of the switchmen's strike was quickly followed by full resumption of blast furnace operations in this district. Traffic conditions are getting back to normal and pig iron again is flowing steadily into consumption. Merchant sellers are doing everything possible to satisfy foundry requirements, but demand is far in excess of supply, and this despite the 30-days restriction on consumer inventories.

Chicago — No foundries seriously curtailed operations due to lack of iron during the recent railroad switchmen's strike. In most cases, difficulty was avoided by using more scrap in melts. Pig iron supply remains critical, however, because of the time required to break the freight car log jam; there is also an actual shortage of cars. Merchant blast furnaces were forced to lay iron on the ground during the strike and now are unable to get enough cars to move it out. Of the districts, 42 blast furnaces, 40 are now operating.

Scrap . . .

Scrap Prices, Page 130

Boston — Steelworks complain of short supply of No. 1 heavy melting steel, but buying since the rollback in prices has been light. Yard dealers' buying of unprepared heavy steel scrap range from $20 to $22 per ton; incoming tonnage is light. Cast is slightly more active.

Philadelphia — Scrap supply is increasingly stringent. One eastern steel mill has less than three days' supply on hand. It will be a case of touch-and-go until spring-time and it is doubtful if even then much relief will be afforded. Shortage of cars hampers movement of scrap, although it has eased somewhat since the end of the rail strike. Foundries, which are trying to step up their operations to more than five days a week, are having difficulty obtaining enough cast scrap.

Philadelphia—Shortage of scrap is more acute. Some steel plants' inventories are dangerously low. And there appears to be no prospect for improvement before spring. Fairly open winter along the seaboard stimulated flow of scrap and the pressure for tonnage has been unusually strong for months. Operators of automobile graveyards are turning more to salvaging than scrapping.

Pittsburgh—The local scrap market has settled down to a period of relative quiet following imposition of government price ceilings. Heavy tonnage moved from yards prior to the ceiling price date with the result dealer stocks are pretty well down.

On the whole, the ceiling schedule, naming $44, Pittsburgh, as base on No. 1 heavy melting steel, is viewed by the trade as satisfactory and sufficiently high to encourage collections.

Some adjustments in the schedule are expected in conformity with unfolding economic developments. Any "bugs" in the order, and according to scrap dealers there are a number, will likely be removed in due time. One such "bug", ban on inclusion of galvanized material in No. 2 bundles, was removed by the Office of Price Stabilization last week.

Buffalo—Concern mounts over failure of scrap collections to improve. Fresh supplies are at a minimum following the rush of material at higher price levels in effect prior to the establishment of government controls. Mill reserve stocks continue to shrink and they would be willing to place additional orders at prevailing prices but dealers appear indifferent.

Detroit—Although the switchmen's strike prevented dealers from delivering all the scrap they wanted to before the price freeze, some mills claim tonnage offered them now is skimpy, but can't tell whether this indicates dissatisfaction with the prices or just lack of material. The latter generally appears to be the case. The automotive industry is up in the air over how it will dispose of its scrap under OPS regulations. Traditionally sold to the highest bidder, the scrap can no longer be put up for grabs on the basis of price since all bids would be the same. A ruling has been asked from OPS. The question probably will become academic in a short time since an allocation system in all probability will be set up.

Cleveland—Movement of scrap is slow. Confusion over interpretation of various provisions of the government price order causes dealers and brokers to move cautiously pending clarification. At the same time, operators of yards are replenishing stocks, especially of the better grades, following the heavy drain experienced immediately prior to the price rollback. Shipments to mills are moving on schedule. Foundries are in a precarious position. They are unable to get certain grades which they had been using and use of which is now restricted under the price order.

Cincinnati — Shipments of scrap from dealers have slackened, a natural sequel to the strenuous effort to move all tonnage possible before the price rollback.

Chicago—The scrap market is in the initial phase of returning to normal following impact of the OPS price freeze and the railroad switchmen's strike. The latter seriously interfered with the objective of brokers and dealers in completing the bulk of old orders before the Feb. 7 price rollback deadline. Some mills were caught short of scrap because of the rail tieup and at least two more weeks will be required to restore traffic to even keel. Foundries which bought scrap sparingly in weeks ahead of the freeze now find they overplayed their hands. Dealers' yards were cleaned bare, and of the foundry scrap now available a good part must be brought from some distance.

St. Louis—Scrap market quickly got back to normal with publication of price ceilings. Dealers' yard stocks are virtually cleaned with exception of some tonnage held up by the switchmen's strike. Most incomplete contracts at the old prices were renewed at the ceiling levels. A substantial amount of new mill and foundry buying is under way, but less than brokers anticipated.

San Francisco — "Rollback" is a misnomer so far as San Francisco area scrap prices are concerned. Instead of rolling back, the new ceiling prices raise most grades of steel scrap in this market. Examples: No. 1 heavy melting, between $30 and $3[illegible] a gross ton under the old formula

How the BWH ROTOCURE PROCESS eliminates OCS*

— a major cause of Premature Belt Failure

IN every 30 to 40 feet of belting cured by the flat press method, there's a 2" to 4" danger zone which often means trouble ahead. These zones consist of overcured or doubly cured segments — the result of "stop and go" vulcanization in which the previously cured portion is advanced *less* than a press length. These overcured sections constitute a mere 1/240th to 1/90th of the belt but invite serious surface wear and structural weaknesses that can cause early failure of the entire belt!

Not so with BWH ROTOCURED belts, however. They are the only belts made by a continuous, never-ending curing technique. THERE ARE NO OVERCURED SEGMENTS. ROTOCURE (even, uniform cure) benefits users 4 specific ways as it steps up efficiency and cuts belt maintenance costs. RESULT: *LOWER COST PER TON OF MATERIAL CONVEYED!*

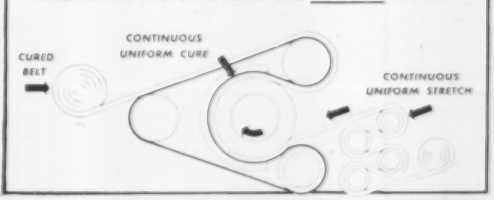
1. **Because there is no double vulcanization, uniform abrasion resistant covers are always assured.**
2. **Continuous vulcanization eliminates overlaps which can reduce flex life up to 40%.**
3. **Mechanical distortion (inherent with flat press curing at the press ends) is eliminated.**
4. **Constant, uniform stretch results at all times.**

BWH ROTOCURED BELTS will give you appreciably longer performance, lower your costs and spare you maintenance headaches. Remember, only BWH Conveyor belting offers you the decided advantage gained through the exclusive ROTOCURE PROCESS.

P. S. If you're interested in transmission belting, look to BWH and ROTOCURE for all the above PLUS advantages! BWH transmission belts have a higher coefficient of friction because dusting agents are not required. RESULT: belt tensions are minimized and belt life is extended.

* "Overcured Sections." You won't find them in BWH Rotocured Process Belts. These critical sections are present every 30' to 40' in all belts made by the flat press process. Only Rotocuring eliminates this cause of belt failure.

DIAGRAMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



BWH DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

is established at $35; No. 2, $28-$32, now is $33, and machine shop turnings, formerly $16, are set at $25.

Dealers "unloaded" their yards prior to price announcement by the Office of Price Stabilization. Generally, dealers are "fairly satisfied" with the new prices. One said there have not been "too many squawks".

Los Angeles—Seeing an end to under-the-table deals and increased flow of scrap to their yards, dealers generally welcome price controls. The gap between eastern and western scrap prices previously ranging from $12 to $20 is narrowed to $9, giving dealers still more cause for contentment.

Seattle—Dealers and buyers have not yet had time to digest the new price regulation, but stabilization of the market is expected to stimulate movement of material. Shipments delayed by the railroad strike are now arriving. Larger consumers have been relying on stocks.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 124

Philadelphia—Five thousand tons of English coke arrived here for shipment to a Cleveland buyer. This is the first English coke received in a long time, and likely will be the last for a long time to come. It was purchased six months ago when England was driving for American dollars.

Pittsburgh—Wilputte Coke Oven Division, Allied Chemical & Dye Corp. will erect two coke batteries of 87 ovens each at the Fairless Works of U. S. Steel Co. near Morrisville, Pa. The ovens, contract for which was let last week, will have combined capacity of 916,000 net tons of coke annually, in addition to large quantities of gas and chemicals.

Chicago—Metallurgical coke continues a tight item, despite end of the railroad strike. A number of foundries averted shutdown or curtailment during the shipping tie-up by trucking fuel in or by borrowing. At least two weeks and maybe longer will be required to break the freight car jam and to restore traffic to normal. A complicating factor is the shortage of cars in which to load. For most foundries, the fuel shortage is more critical than that of metallics.

Warehouse . . .

Warehouse Prices, Page 125

Boston—Warehouses are turning away numerous mill-size orders, spreading available tonnage with as many consumers as possible. Average sale with many is around 650 pounds. Replacements are around 75 per cent of base quotas on carbon products, this base being limited by slack volume one year ago.

New York — Directly rated DO orders for carbon steel placed with warehouses are slightly heavier but spotty. More volume in this category is appearing in alloys than in carbon. Restrictive orders on molybdenum, nickel and tungsten are affecting alloy buying, but consumers are slow to substitute for higher-nickel stainless, although more straight chromium is now moving.

Philadelphia — Warehouses are watching receipts closely. On practically all grades tonnage is no sooner received from the mills than it is sold. Bar rounds up to 2-in. and fast-cutting screw steels are in terrific demand, as well as sheets and light plate. It is impossible for distributors to maintain inventories in shapes and small angles. Distributors note some increase in DO orders, but such business has not yet reached the volume anticipated.

Cleveland—Tight supply conditions in the warehouse market show no sign of easing though some distributors report their mill receipts, except for interruptions during the recent switchmen's strike, were fairly satisfactory. Inventories, however, are badly unbalanced and extremely low in the more popular items, such as sheets, strip, bars, plates and structurals.

Cincinnati—Mill shipments to warehouses in this district dropped in recent weeks. All steel is in light supply, and stocks so unbalanced shopping around by customers is becoming general.

San Francisco—The leading warehouse in specialty steels in this area reports overwhelming inquiry for these products, with little hope of meeting anything but a fraction of the demand, due to increasing scarcity growing out of the restrictions on use of cobalt, nickel and molybdenum.

Seattle—Wholesalers are trying to satisfy an unusually heavy demand from their customers but are handicapped by inadequate supplies. Inventories are only 40 per cent of normal. Sheets and plates are the most critical items while bars and structurals are increasingly scarce.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5500 tons, power plant, units 1 and 2, Wisconsin Electric Power Co., Oak Creek, Wis.; divided between Worden-Allen Co., Milwaukee Bridge Co., and Wisconsin Bridge & Iron Co., all of Milwaukee.

625 tons, I-beams, Navy purchasing office, Washington, to Bethlehem Steel Co.

450 tons, high school, Falmouth, Mass., to West End Iron Works, Cambridge, Mass.; Platt Contracting Co. Inc., Cambridge, general contractor; Joseph T. Ryerson & Son Inc., Cambridge, 50 tons reinforcing.

400 tons, addition, Armstrong Cork Co., South Braintree, Mass., to Bethlehem Steel Co.

350 tons, plant addition, Raybestos-Manhattan Inc., Crawfordsville, Ind., through William F. Lotz Inc., Philadelphia, to Bethlehem Fabricators Inc., Bethlehem, Pa.

320 tons, Gladstone street school, Cranston, R. I., to Tower Iron Works, Providence; R. I.; Westcott Construction Co., Providence, general contractor.

300 tons, Pennsylvania Railroad bridges, Morrisville, Pa., to Ft. Pitt Bridge Works, Pittsburgh.

300 tons, telephone plant addition, Spokane, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co., Seattle, general contractor.

210 tons, bridge F-554, Pottawattamie county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

190 tons, bridge SN-1853, Cass county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

190 tons, school, Milton, Mass., to West End Iron Works, Cambridge, Mass.; Vara Construction Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

9500 tons, completion, McNary lock and dam, Umatilla county, Oregon; bids to district engineer, Walla Walla, Wash.

320 tons (also 75 tons reinforcing) Washington state highway bridge, Lewis county; no bids received Feb. 6; new bids to Olympia Feb. 20.

300 tons, unstated government [illegible] eastern Washington; bids Feb. 28.

225 tons, two bridges, Oldtown, [illegible] Mar. 2, direct on steel, Augusta, Me.

135 tons, structurals and steel bear[illegible] bridge, Ashuelot river, Keene, N. [illegible] Feb. 23, Concord, N. H.

Unstated, plant, Lansdown Tube Co., Frederick, Md.; bids asked.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, Oliver Iron Mining Co., [illegible] to United States Steel Supply Co., Chicago.

500 tons, auxiliary sewer, Kostner Ave., contract 3A, to United States Steel Supply Co., Chicago; M. J. Boyle & Co., Chicago, contractor.

500 tons, school, Louisville, Ky., to United States Steel Supply Co., Chicago.

315 tons, junior-senior high school, Randolph, Mass., to Bethlehem Steel Co.; Hayes & Watkins Construction Co., Brockton, Mass. general contractor; West End Iron Works, Cambridge, 70 tons, structural steel.

313 tons, superstructure, new building, Catholic Order of Foresters, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

300 tons, library, Trinity College, Hartford, Conn., to Scherer Steel Co., Hartford; Industrial Construction Co., Hartford, general contractor; Standard Structural Steel Co., Hartford, 60 tons, structural steel.

300 tons, Gladstone street school, Cranston, R. I., to Plantation Steel Co., Providence, R. I.; Westcott Construction Co., Providence, general contractor.

192 tons, new building, Illinois Bell Telephone Co., Blue Island, Ill., to United States Steel Supply Co., Chicago.

175 tons, school, Milton, Mass., to Northern Steel Inc., Boston; Vara Construction Co., Boston, general contractor.

135 tons, state highway, Freeport, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; W. H. Hinman Inc., North Anson, Me., general contractor.

110 tons, bars and H-piling, bridge substructure, Caribou, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Forest Frederick, Pittsfield, Me., general contractor.

REINFORCING BARS PENDING

7700 tons, housing project, Dorchester Park, Chicago.

6000 tons, 17-mile reach, East low canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Mar. 22.

2000 tons, Cabinet Gorge, Idaho, power project for Washington Water Power Co., Spokane, Wash.; general contract to Morrison-Knudsen Co., Boise, Idaho.

1400 tons, government project, United States Engineer, Peoria, Ill.

1000 tons, apartment building, 11820 Edgewater Dr., Lakewood, O.

405 tons, Allegheny-Ludlum Steel Corp., Brackenridge, Pa.

250 tons, senior high school, Keokuk, Iowa.

250 tons, building, Cutler-Hammer Inc., Milwaukee.

165 tons, administration and dormitory building, Franklin, Wis.

125 tons, plant No. 2, Goodyear Tire & Rubber Co. Inc., Akron, O.

125 tons, two Washington state highway spans, Lewis county; general award to Bennett Campbell, Seattle.

125 tons, plant, Chain Belt Co., Milwaukee.

PLATES . . .

PLATES PLACED

975 tons, hull plates, Navy purchasing office, Washington, to U. S. Steel Co., Pittsburgh.

PLATES PENDING

Unstated, four 27-foot diameter penstocks, also tunnel liner plates; Cabinet Gorge power project, Idaho; general contract to Morrison-Knudsen Co.

PIPE . . .

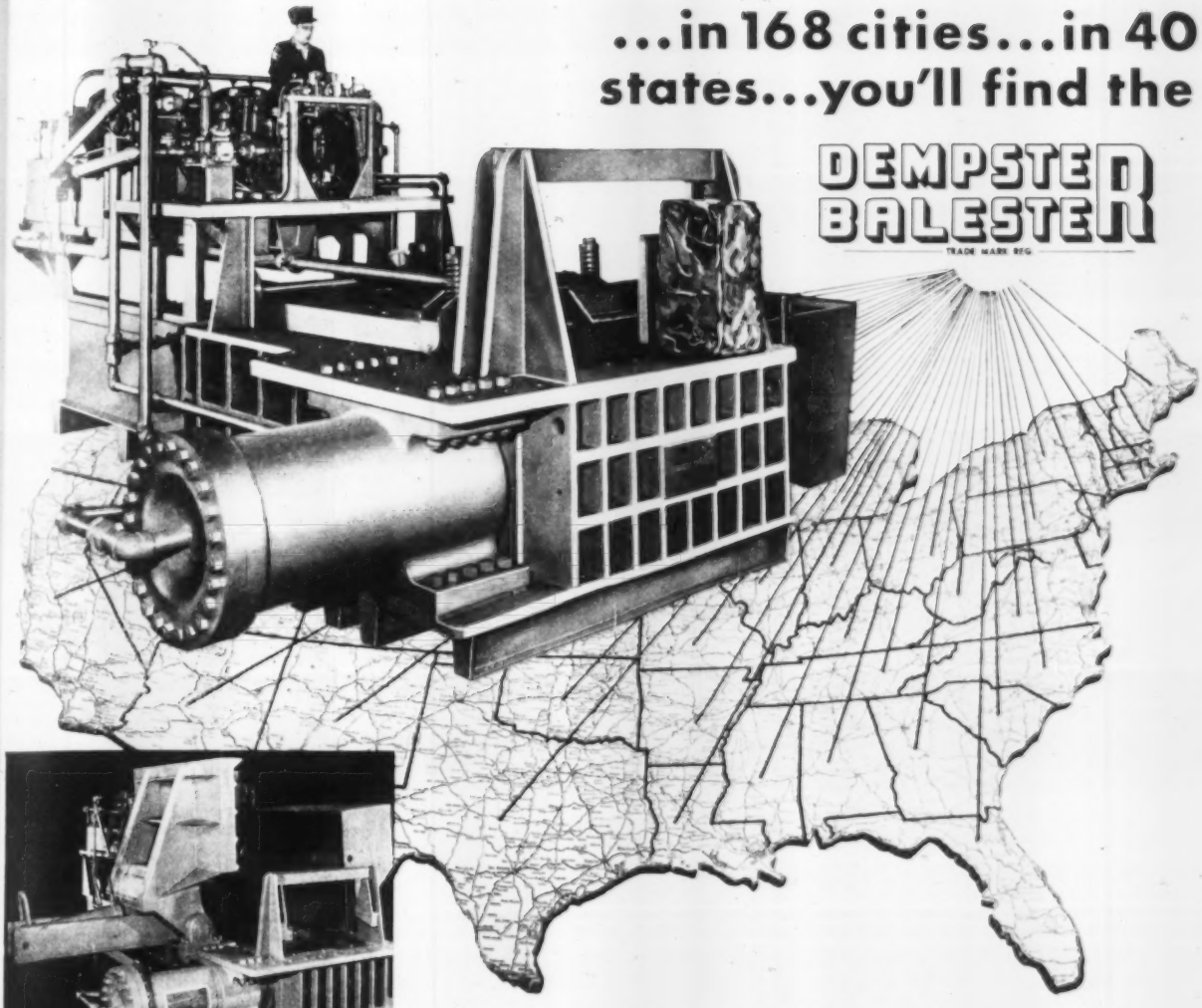
CAST IRON PIPE PLACED

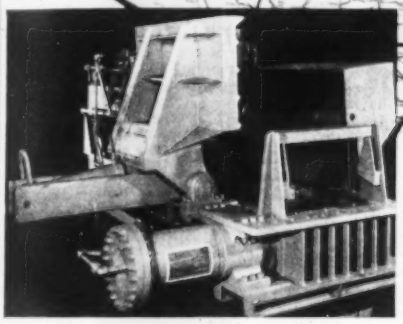
1050 tons, 4 to 16-inch, Worcester, Mass., to R. D. Wood & Co., Florence, N. J.

...in 168 cities...in 40 states...you'll find the

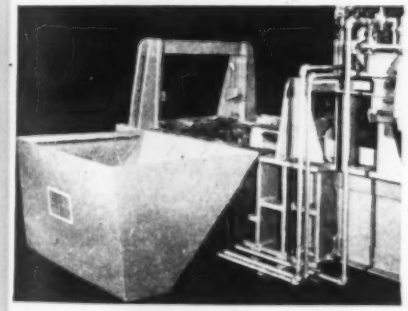
DEMPSTER BALESTER

TRADE MARK REG





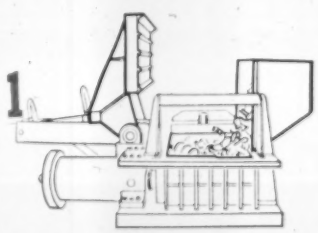
Skip-Pan Loader in unloading position with Auxiliary Compression Door ready for compression stroke.

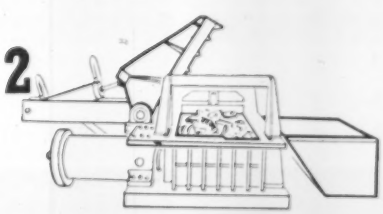


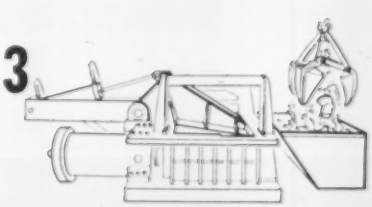
Skip-Pan Loader in re-loading position, while Auxiliary Door compresses scrap.

The first Dempster Scrap Metal Baling Press was manufactured only 10 years ago. Today you'll find them throughout the nation. . . in 168 cities. . . doing a production job that only the "Balester" can do for efficiency and low cost. Here is the "600" that turns out bales at an approximate rate of 6 to 7½ tons per hour. With Auxiliary Compression Door, it is the nearest thing available to "Automatic" baling. Every phase in the baling cycle is operated by hydraulic controls.

Shown below is the 1-2-3 production punch with Skip-Pan Loader and Auxiliary Compression Door. 1. Skip-Pan dumps metal into charging box. 2. Door begins stroke and Skip-Pan returns to loading position. 3. Door compresses scrap with a 45-ton force while Skip-Pan is reloaded. The Auxiliary Compression Door completely eliminates in most operations, and materially reduces in others, the cost of tying up two or three extra arrangers. The Dempster-Balester is built in four models, with capacities from 2 to 7½ tons per hour. If you are interested in baling scrap metal, see a Dempster-Balester in operation near you. Write for nearest installation. A product of Dempster Brothers







DEMPSTER BROTHERS, 621 Dempster Building, Knoxville 17, Tennessee

CAST IRON PIPE PENDING

500 tons, 8, 6 and 4 inch cast iron pipe, [illegible] alternatives; bids to Port Angeles, [illegible], Feb. 26.

155 tons, 3600 feet 14 inch cast iron pipe, [illegible] in to Silverton, Oreg.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago & Northwestern, 72 diesel-electric locomotives, comprising: 40 switchers and 8 passenger units, placed with Electro-Motive Division, General Motors Corp., La Grange, Ill.; 18 switchers and 4 freight units, with American Locomotive Co., New York; 2 switchers, with Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

Reading Co., 30 yard engines, 15 each, Baldwin-Lima-Hamilton Corp., Philadelphia, and American Locomotive Co., New York.

FERROALLOYS

(*Continued from page 125*)

4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered, Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N, add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%.) Contract, c.l. S M x D, bulk 23.25c per lb of contained Cr, c.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, Carload, packed, S MxD, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium; ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $3.25 per lb of contained W; 2000 lb W to 10,000 lb W, $3.25; less than 2000 lb W, $3.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $4.15 per lb of contained W; less than 1000 lb W, $4.25.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.6c. Delivered. Spot, add 0.8c.

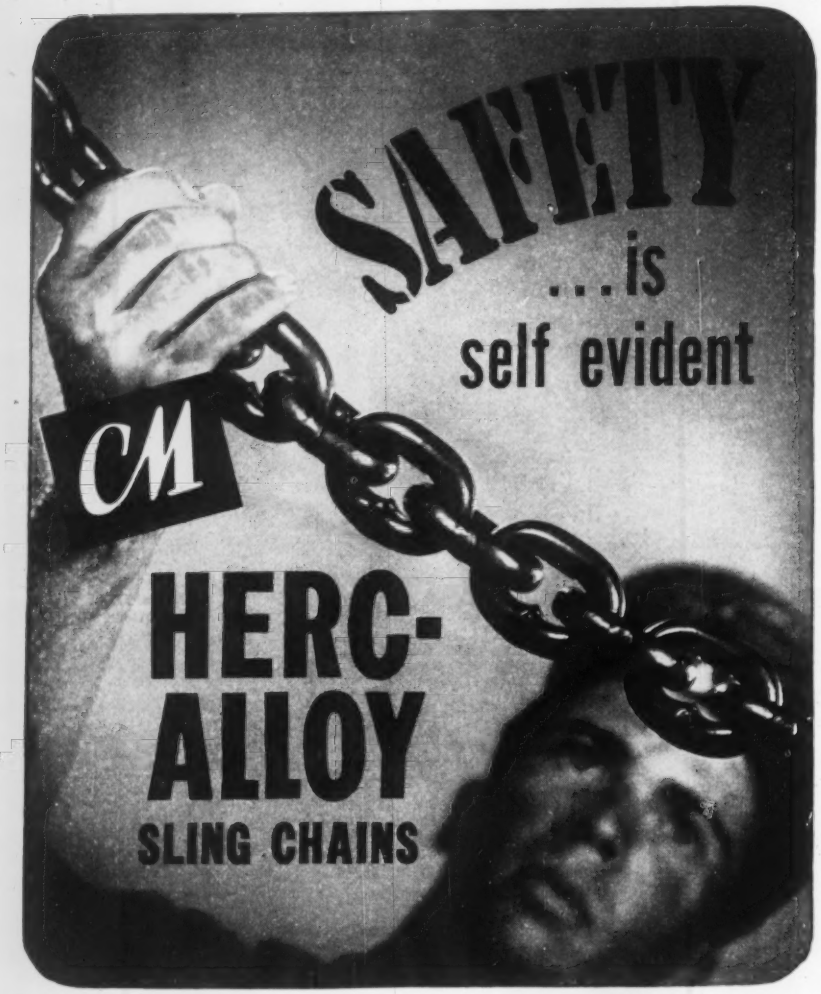
80-90% Ferrosilicon: Contract, carload, lump, bulk 15.55c per lb of contained Si, carload packed 16.8c, ton lot 17.8c, less ton 18.90c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max.



HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain . . . first to bear a serial number.
- *Every* CM HERC-ALLOY Sling Chain is alloy steel throughout . . . links, rings, hooks. There is only one grade . . . *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
- HERC-ALLOY Chains are lighter . . . stronger . . . easier to handle . . . outlast ordinary chains 4 to 5 times . . . cost less on the job.

HERC-ALLOY . . . the chain you can *SEE* is safe

● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY . . . because HERC-ALLOY Chains are immune to unseen dangerous crystallization . . . because you can *see* when a HERC-ALLOY Chain needs repairs or replacing.

*Write for your copy of this new, informative booklet. No charge.

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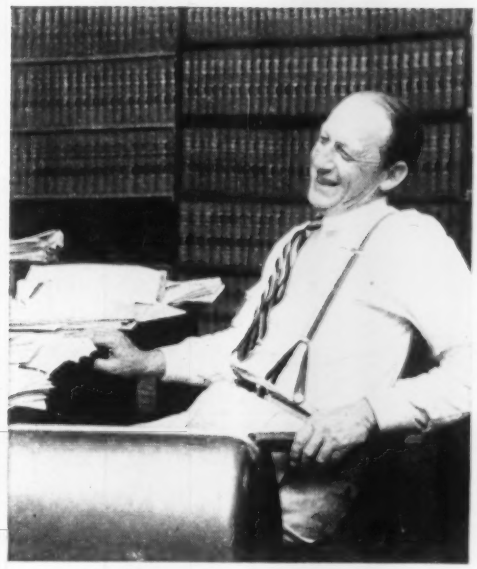

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. . . like so many other Americans who went to their doctors at the first sign of one of cancer's danger signals.

By showing Americans what they can do to protect themselves and their families against cancer, the American Cancer Society is saving thousands of lives *today*. By supporting science and medicine in the search for the causes and cures of cancer, the Society hopes to save countless more *tomorrow*. Do you know the seven common danger signals that *may* mean cancer: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

To guard yourself, and those you love, against cancer, call the nearest office of the American Cancer Society or address your inquiry to "Cancer" in care of your local Post Office.

American Cancer Society

Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.85c, smaller lots 12.15c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton lot 16.0c, less ton 16.9c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-20%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delivered. Spot add 0.25c.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained Va. Delivered, Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max. Al 0.50% max., C 0.50% max.). Contract 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, delivered; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24%, P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

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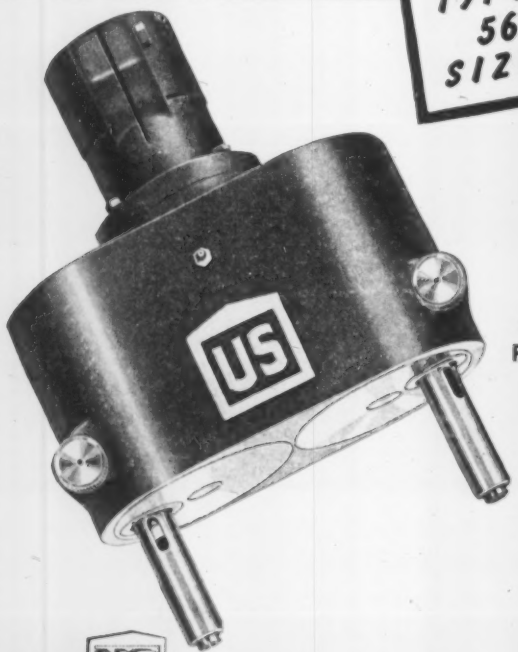

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Alabama

Electric light bulbs will be made in a plant to be built at Reform, Ala., near Tuscaloosa, by **Westinghouse Electric Corp.**, Pittsburgh.

California

Marine **Magnesium Products Corp.**, So. San Francisco, Calif., was sold to Merck & Co. Inc., Rahway, N. J. Marine Magnesium's plant produces magnesium salts from sea water.

California

Axelson Mfg. Co., Los Angeles manufacturer of aircraft parts, oil pumping equipment and other heavy machinery, will build a plant in Montebello, Calif.

California

Lockheed Aircraft Corp., Burbank, Calif., will construct a $750,000 jet plane assembly plant in Palmdale, Calif.

California

California Institute of Technology, Pasadena, Calif., will start a $1 million expansion of its jet propulsion laboratory in the upper Arroyo Seco. Under construction are additions to liquid propellant research buildings.

California

Whitney Chain Co., Hartford, Conn., is occupying its new office and warehouse building at 5400 Pacific Blvd., Los Angeles. This branch is under the direction of A. J. Swisler, district manager.

California

Tungsten ores, middlings and low-grade tungsten concentrates will be purchased by **United States Vanadium Co.**, division of Union Carbide & Carbon Corp., New York. This administrative change has been made since the corporation announced (STEEL, Feb. 5, p. 48) that Electro Metallurgical Division was operator of the Pine Creek, Bishop, Calif., mine and mill.

Connecticut

Parker Stamp Works Inc., Hartford, Conn., purchased the entire business of Schoder & Lombard Stamp & Die Co., New York, manufacturer of steel stamps, dies, plastic molds and allied products.

Delaware

Precision Instruments Inc. was chartered by the secretary of state's office, Dover, Del. Capital Trust Co. of Dover, Del., is serving as the principal office.

Delaware

West Texas Gulf Pipe Line Co. filed a charter of incorporation with the secretary of state's office, Dover, Del. Capital of the firm is listed at $10 million. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Illinois

Marshall Steel Co., McCook, Ill. (post office LaGrange), completed installation of an 84-inch hearth heat treating furnace of 8000 pound capacity to expand and facilitate a more complete service to its customers. This furnace will be used for the spheroidize annealing of tool steel as well as general heat treating.

Illinois

Cummins Business Machines Corp., Chicago, changed its name to **Cummins-Chicago Corp.** This firm manufactures perforating machines and portable electric tools.

Illinois

Illinois Institute of Technology, Chicago, received an initial grant of $2500 to provide partial scholarships for upperclass students of metallurgical engineering. This is the 13th college to participate in the scholarship program of the Foundry Educational Foundation. The four-year-old program is designed to interest young men in the foundry industry; to present the foundry industry as an engineering field; and to develop instructors, researchers and technicians in foundry work.

Massachusetts

Van Norman Co.—machine tools—Springfield, Mass., appointed E. L. Essley Machinery Co., Chicago, as its sales representative in Illinois, Wisconsin, Iowa, western Michigan, eastern Nebraska and northern Indiana.

Missouri

Sligo Inc., St. Louis, manufacturer of steel products, awarded contract for erection of a warehouse in that city at an estimated cost of about $175,000.

Nevada

H. W. Gould & Co., San Francisco, plans to erect a plant

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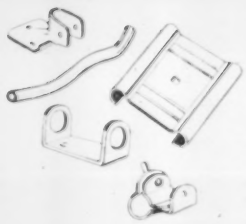

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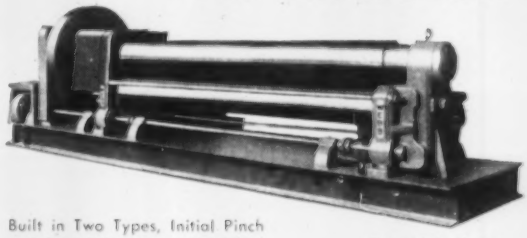

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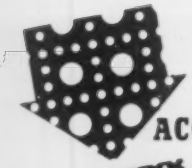

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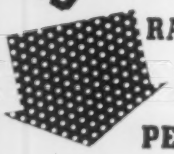

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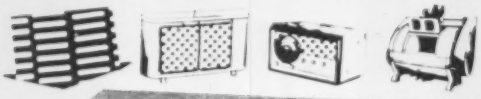

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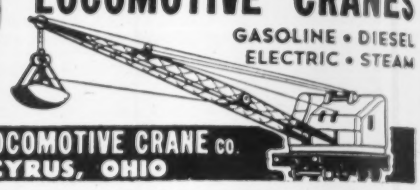

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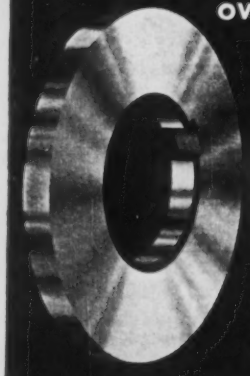

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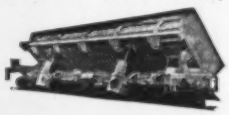

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New York

Van der Horst Corp., Olean, N. Y., leased space in the former Pennsylvania Railroad shops in that city for the chrome plating of engine cylinders for government orders.

New York

Rome Cable Corp., Rome, N. Y., will begin construction soon of a factory in that city for production of special communications wire for the armed forces.

New York

Lake Erie Engineering Corp., Buffalo, is spending more than $1 million to expand production in its plant here by about 30 per cent. Most of the outlay will be for machine tools.

New York

General Electric Co., Schenectady, N. Y., plans a $200,000 addition to its television picture-tube plant in Buffalo.

Ohio

Youngstown Foundry & Machine Co., Youngstown, will build additions to its No. 1 machine shop and foundry, at a cost of about $300,000. Bethlehem Steel Co., and Fort Pitt Bridge Works, Pittsburgh, are the contractors.

Oklahoma

Empire Pattern & Foundry Co., Tulsa, Okla., made an agreement with Meehanite Metal Corp., New Rochelle, N. Y., to install the Meehanite manufacturing processes. They will manufacture Meehanite castings of various types.

Oregon

U. S. Lime Products Co., Los Angeles, plans to build a $1.5 million plant in St. Johns, a suburb of Portland, Oreg. Installation will include rotary kilns and other modern equipment.

Pennsylvania

Barrett-Cravens Co., Chicago, merged with the Crescent Truck Co., Lebanon, Pa., manufacturer of electric industrial trucks and tractors. This completes the Barrett line of "floor level" materials handling equipment. All sales will be conducted from the general office of Barrett-Cravens Co. in Chicago. Engineering and manufacturing operations will be continued at Lebanon, Pa.

Washington

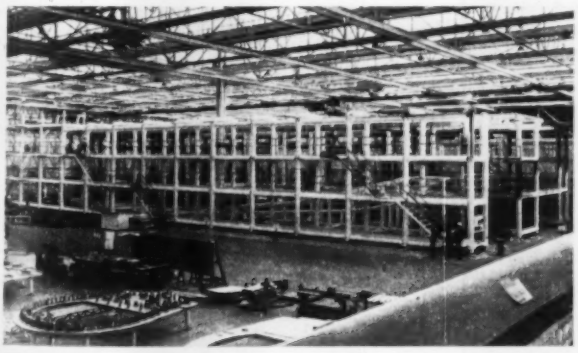
General Chemical Co., subsidiary of Allied Chemical & Dye Corp., New York, awarded a general contract to E. P. Erwen for construction of a $350,000 chemical plant in Richland, Wash. Nitric acid will be produced for use by General Electric Co. at the Hanford, Wash., plant. Stainless steel tanks will be fabricated by a Seattle plant.

Washington

Hart Construction Co., Tacoma, Wash., has a general contract to erect a plant in that city for **Pacific Derlikon Co.,** affiliate of Swiss Co., Zurich, Switzerland, to manufacture electrical equipment.

Wisconsin

Cutler-Hammer Inc., Milwaukee, will erect a plant in that city at an estimated cost of $2,750,000. It will be used for manufacture of metal enclosures for motor controls and for assembly and test of motor controls.



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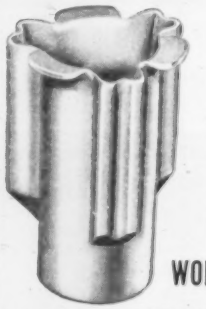

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